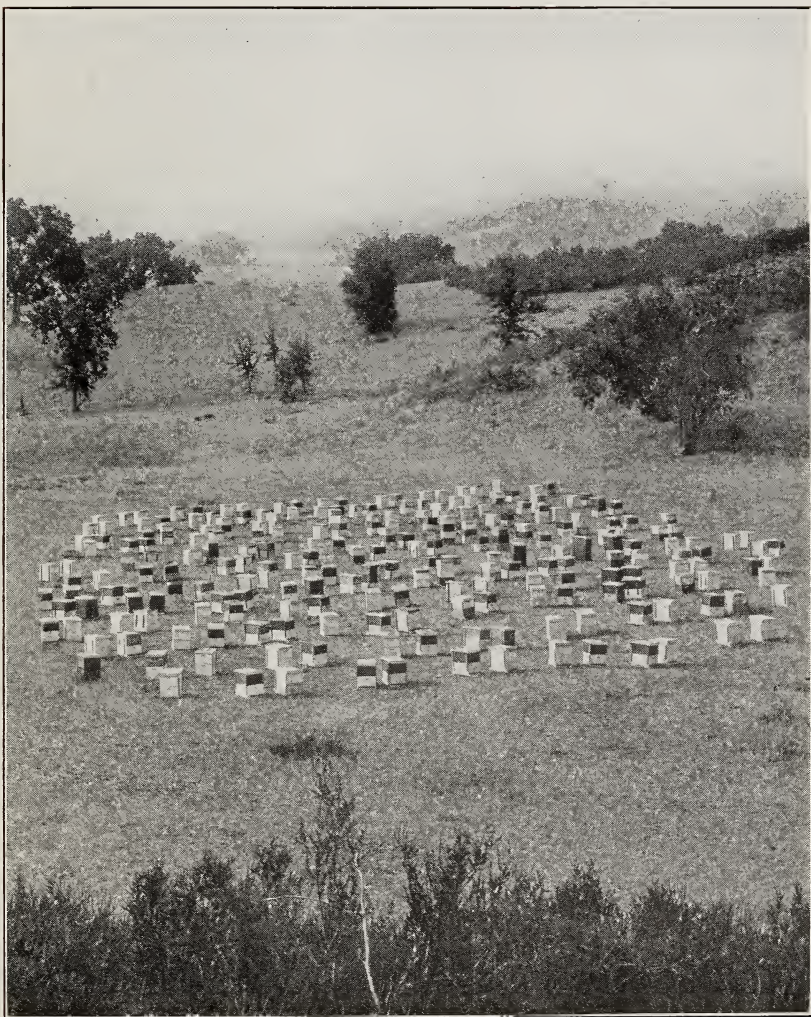


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Gleanings ⁱⁿ Bee Culture



Migratory Beekeeping in the Sage Regions of Southern California

VOL. XLVIII

May, 1920

NUMBER 5

HAVE YOU RECEIVED OUR 1920 CATALOG?

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**BEEKEEPERS'
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*Unexcelled manufacturing and
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W. W. Boyer & Co., Inc.
Baltimore, Maryland

"Griggs Saves You Freight"--Toledo

May is here, and the good familiar song of the Honeybees in the fruit bloom with it. Just one more month and the great honey harvest will be upon us, but the question is will you be prepared? Don't lose the best of the crop, because you waited to get your supplies. Order them today, and from TOLEDO, the most direct line to you in the country, and shipments go forward promptly, and at factory prices.

LIVE BEES IN 3-LB. PACKAGES WITH QUEEN.

If you have lost any bees the past winter, let us send you some of our 3-lb. packages next month to replace them, and save those good combs from the moth worm; besides, bear in mind one package will pay for 3, and the 3-lb. package is the most profitable to buy. Only a limited number to spare so order today.

NEW AND SECOND-HAND HONEY CANS.

We have a good stock of both new and second-hand cans. Our second-hand cans have only been used once, and are nice and bright inside, and in good re-shipping cases; they are as good as new and only one-half the price of new; they are going fast; so don't delay, order today.

BEESWAX—BEESWAX.

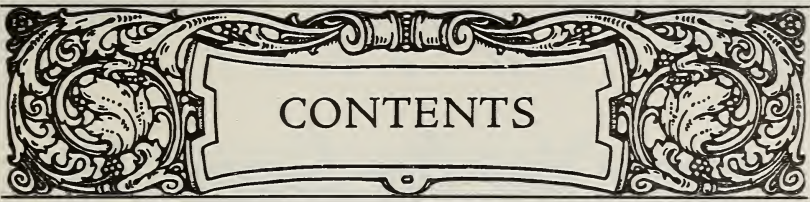
We have an unlimited demand for good, first-class wax and will pay highest market price for all grades, but for Fancy Yellow Wax we will pay a premium over the market price. Write us how much you have and price wanted in first letter.

Free Catalog and Special Bee Price List.

We want every beekeeper to have our catalog, and your name and address upon a postal will bring it. Write today.

THE GRIGGS BROTHERS CO. Dept. No. 25 TOLEDO, O.

"Griggs Saves You Freight"



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THE A. I. ROOT COMPANY, Publishers, Medina, Ohio

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Order Your Bee Supplies Now

NOW is the time to check up on your hives and accessories to make sure that everything is complete and in perfect condition for the coming season. Our complete line of Bee Supplies includes everything needed by the modern Beekeeper. Besides our own exclusive articles, we are distributors for the famous Lewis Beeware line, and dealers in Root's Extractors and Smokers, and Dadant's Foundations. Orders placed now can be filled promptly. Prices on many articles are sure to advance within the next few months. Send for our large 1920 Catalog today.

Beeswax Rendered from Old Combs

WE pay you the highest market price for rendered wax, less 5 cents per pound rendering charge. Our special hydraulic steam wax press gets the very last drop of wax from old combs and cappings assuring you maximum profit on them. Write for full particulars.

Best Prices Paid for Honey

Tin Rabbits,
Hives, all sorts
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Root's Smokers
Excluders, all makes
Division Board

Wax Extractors

Metal Spaces
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Honey Boards

Covers for Hives
Observation Hives

SEND us samples of your honey and we will quote you a price equal or better than that of any other concern. We buy and sell both comb and extracted honey. Cash remitted in full the same day shipment is received.

Send for Our Large New
1920 Catalog

THIS new catalog contains over 40 pages of every variety of Beekeepers' Supplies, including all the latest and most improved devices. It is really a valuable reference book on beekeeping accessories. :- :- :- :- :- :-

THE FRED W. MUTH CO.
"THE BUSY BEE MEN"

CINCINNATI, O

BEESWAX WANTED

We require approximately 50 tons of beeswax during the next three months, to take care of the enormous demand for SUPERIOR FOUNDATION. We are paying highest cash prices, and an extra allowance of several cents per pound when exchanged for foundation, bee supplies, or honey cans. Write for prices and shipping tags, stating quantity.

SUPERIOR FOUNDATION

Get our prices on your foundation requirements for the season. We maintain the same high quality in every pound we manufacture. SUPERIOR FOUNDATION assures SUPERIOR RESULTS.

BEE SUPPLIES

We carry a complete stock of bee supplies and honey cans, and can fill your entire order. Prices on request.

Superior Honey Company -:- Ogden, Utah
(MANUFACTURERS OF WEEB PROCESS FOUNDATION)

BEE SUPPLIES

BEE SUPPLIES

SERVICE & QUALITY

Order your supplies early, so as to have everything ready for the honey flow, and save money by taking advantage of the early order cash discount. Send for our catalog--better still, send us a list of your supplies and we will be pleased to quote you.

C. H. W. WEBER & COMPANY

2146 CENTRAL AVE.

CINCINNATI, OHIO

HONEY MARKETS

Since Apr. 15 there has been a decidedly better demand for honey because of the runaway price of sugar. The inquiry from large buyers has been active, and the interest in the market has been keen. What the price of honey is or is to be rests largely with the immediate future of the sugar market. What that is to be, nobody knows. All kinds of predictions are heard as to 30c and even 35c sugar prices. This has resulted in a very decided strengthening of the honey market that makes the U. S. Government Market Report (date of Apr. 15) printed below seem rather stale. As late as Apr. 10 The Market Reporter, published by the Bureau of Markets, U. S. Dept. of Agriculture, heads its latest discussion of the honey situation with "Dullness in Honey Market." This condition has passed—at least so long as sugar prices continue to soar.

U. S. Government Market Reports.

HONEY ARRIVALS, APR. 1-15.

MEDINA, O.—1,000 pounds from Pennsylvania arrived.

SHIPPING POINT INFORMATION—APR. 15.

LOS ANGELES, CALIF.—Demand and movement improving on account of sugar shortage, market active, little change in prices. Carloads f. o. b. usual terms, per lb., white orange blossom 17-17½c, white sage supplies cleaned up, light amber sage supplies very light 16c, extra light amber sage supplies cleaned up, light amber alfalfa, supplies light 15½-16c, white Shasta 16½c. Beeswax, demand and movement moderate; in less than carload lots, 42-43c per lb.

SAN FRANCISCO, CALIF.—Demand and movement good, market active, prices slightly higher on account of high price of sugar. Cash to beekeepers, per lb., extracted, light amber alfalfa 14-14½c. Beeswax, 39-41c.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—Supplies light, demand very limited, market dull. Sales by jobbers to grocers, per lb., comb, New York and Vermont, best 33-37c per section; some light sections 30c. Extracted, California, light amber in 60-lb. cans 22-23c per lb. Beeswax, no sales.

CHICAGO.—No carlot arrivals, supplies moderate, market inquiry, demand and movement slow, market steady. Sales to jobbers, extracted, per lb., California, Idaho, Colorado, Wisconsin, white 18-20c, light amber mostly 17c, dark amber 16-16½c. Cuban, light amber 14-14½c. Comb, supplies light, Idaho, Colorado, Wisconsin, No. 1, 24-section cases \$7.75-8.00. Beeswax, receipts light, supplies moderate, demand and movement good, market steady. Sales to jobbers, per lb., California, Colorado, Minnesota, light 42-45c, dark 40-41c.

CINCINNATI.—No arrivals, demand improving but practically no movement, no supplies on market. Beeswax, demand and movement good, market steady. Sales to jobbers, per lb., average yellow 44-46c.

CLEVELAND.—Supplies liberal, demand and movement moderate. Sales to jobbers, per lb., Western, 60-lb. cans dark amber 22c, light sage 20-25c.

KANSAS CITY.—Since last report 1 car Oregon, 1 car Idaho arrived. Supplies liberal, demand and movement moderate, market steady. Sales to jobbers, comb, 24-section flat cases Missouri light \$8.00-9.00, Western light No. 1 mostly \$7.50. Extracted, per lb., Western, light amber 20c, dark 15-17c.

MINNEAPOLIS.—Supplies liberal, demand and movement limited, market steady. Sales direct to retailers, comb, Western, No. 1 white, 24-section cases \$7.25. Extracted, Western, 60-lb. cans light amber 20-21c per lb.

NEW YORK.—No domestic arrivals since last report on account of strike and embargo. Supplies light, demand and movement slow, market dull and unsettled. Sales to jobbers, per lb., extracted, do-

mestic, California, white orange blossom 18-19c, light amber sage 15-16c. New York, sweet clover 15½-16c. Comb, supplies exhausted. Beeswax: No domestic arrivals since last report on account of strike and embargo, supplies light, demand and movement light, market dull. Sales to jobbers, per lb., New Yorks and Middle Westerns and Californias, light 38-39c, dark 37-38c. South American, light 41-45c; African light 33-36c, dark mostly 33c. PHILADELPHIA.—No arrivals, no sales reported.

ST. LOUIS.—Supplies moderate, demand and movement slow, market dull. Sales to jobbers, per lb., extracted, Southern, 60-lb. cans light amber 15-16c, dark 13½-15c. Comb, no supplies on market. Beeswax, no sales.

ST. PAUL.—Supplies moderate, demand and movement limited, market steady. Sales direct to retailers, comb, Western, No. 1 white, 24-section cases \$7.25-7.50.

George Livingston,
Chief of Bureau of Markets,

U. S. Dep't of Agriculture.

Special Foreign Quotations.

LIVERPOOL.—During the past month the market has been very quiet, with a limited trade. The following sales have been made: 170 barrels Chilean, chiefly No. 2 at \$21.25 per cwt. No. 1 at \$23.75 to \$24.35 per cwt.; 60 cases Guatemala at \$23 per cwt. Other honey has been selling at late rates.

The beeswax market is also quiet; 230 bags of Chilean have been sold at \$54 with retails of fine yellow to bleached at \$54.50 to \$60.00.

Taylor & Co.

Liverpool, England, March 30, 1920.

CUBA.—Honey today is worth \$1.15 a gallon; wax brings \$37.50. Adolfo Marzol.

Matanzas, Cuba, Apr. 7, 1920.

Our corps of actual honey-producers were not called upon for their opinions as to prices and conditions for this month, as so little honey remains in the hands of producers.

BEES WANTED.—I have customers for nearly 500 colonies of bees. Prefer apiaries of 25 colonies and more. Shall be glad to hear at once from apiarists having bees for sale in Michigan, Indiana, Kentucky, Ohio, Pennsylvania, or New York. Give full particulars in first letter. Address H. G., care of Gleanings in Bee Culture, Medina, Ohio.

3-Banded Italian Queens

MAY THE FIRST TO JULY THE FIRST

Untested	- - 1,	\$1.50	12,	\$13.00
Tested	- - 1,	\$2.50	12,	\$25.00

H. L. Murry - - - Soso, Mississippi

Dr. J. H. Black, Ft. Deposit, Ala.

Breeder of

Three-band Italian Queens

These queens are as good as can be had. They must be purely mated. Safe arrival guaranteed in United States and Canada.

Untested queens	...	\$1.25;	12,	\$12.00
Select untested queens		\$1.50;	12,	\$15.00

Dr. J. H. Black, Ft. Deposit, Ala.

ITALIAN BEES AND QUEENS

We are prepared to give better service in every respect than we have ever given in Bees and Queens and supplies

UNTESTED QUEENS

To June 15th		After June 15th	
1	\$1.50	1	\$1.25
12 or more	1.25	12 or more	1.00

TESTED QUEENS

To June 15th	\$3.00	After June 15th	\$2.00
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BEES

1-pound packages	\$3.00	2-pound packages	\$5.50
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We will furnish one comb filled full of brood with one pound of bees for \$5.50, no queen. You are almost sure that these will reach you in perfect shape. You get a 50c comb; they will build up much quicker than a 2-pound package. There is no danger of their swarming out.

NUCLEI

1-frame	\$4.00	2-frame	\$7.00	3-frame	\$9.50
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No queens included at above prices.

Nuclei are on good combs, full of brood with plenty of bees.

FULL COLONIES

We can furnish, and can ship on date specified, full colonies of bees in new hives, good comb, and good strong colonies with **Tested Queens**:

8-frame	\$18.00	10-frame	\$20.00
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DR. MILLER'S QUEENS

Let's make this a Miller queen year. Dr. Miller has furnished us breeders from his apiaries, and we are the only ones that he furnishes breeders to. In these queens you get the fruits of the foremost beekeeper of the world. We pay Dr. Miller a Royalty on all queens sold.

To June 15th		After June 15th	
1	\$2.00	1	\$1.50
12 or more, each	1.60	12 or more, each	1.25

We carry a full line of Root's supplies, including the new Root-Weed foundation, Prompt Service.

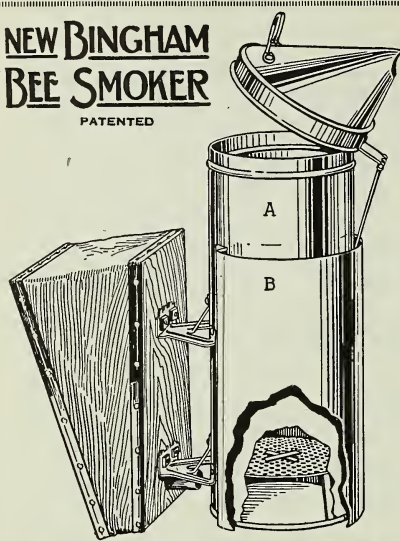
THE STOVER APIARIES

Successors to
THE PENN COMPANY
Penn, Miss.

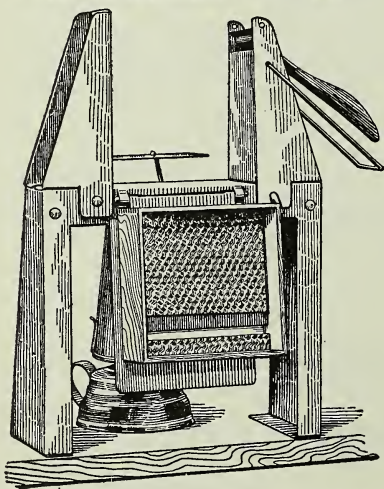
MAYHEW, MISS.

NEW BINGHAM BEE SMOKER

PATENTED



THUM REST



The Bingham Bee Smoker has been on the market over forty years and is the standard in this and many foreign countries. It is the all-important tool of the most extensive honey producers in the World. It is now made in five sizes.

	Size of stove inches	shipping weight lbs.	price
Big Smoke, with shield	4 x10	3	\$2.50
Big Smoke, no shield.	4 x10	3	2.00
Smoke Engine	4 x7	2 1/4	1.50
Doctor	3 1/2 x7	2	1.15
Conqueror	3 x7	1 3/4	1.00
Little Wonder	3 x5 1/2	1 1/2	.80
Smoke Engine or Doctor, in copper,			\$1.00 extra.

The Big Smoke has just been produced in response to a demand for a larger-size smoker, one that will hold more fuel, require filling less often, from extensive bee handlers. The Shield, designated by the letter B in the cut above, is designed as a matter of protection from the hot fire pot. Many hold the smoker by the bellows between the knees when at work, and the shield will prevent burning of the trousers or one's legs.

The Genuine Bingham Honey Uncapping Knife is manufactured by us here at Grand Rapids and is made of the finest quality steel. These thin-bladed knives, as furnished by Mr. Bingham, gave the best of satisfaction, as the old timers will remember. Our Perfect Grip Cold Handle is one of the improvements.

The Woodman Section Fixer, a combined section press and foundation fastener, of pressed steel construction, forms comb-honey sections and puts in top and bottom foundation starters, all at one handling. It is the finest equipment for this work on the market.

TIN HONEY PACKAGES.

2	lb. Friction top cans, cases of 24
2	lb. Friction top cans, crates of 612
2 1/2	lb. Friction top cans, cases of 24
2 1/2	lb. Friction top cans, crates of 450
5	lb. Friction top pails, cases of 12
5	lb. Friction top pails, crates of 100
5	lb. Friction top pails, crates of 203
10	lb. Friction top pails, cases of 6
10	lb. Friction top pails, crates of 113

Special Prices.

Crates of 100 five-pound pails.....	\$ 8.00
Crates of 200 five-pound pails.....	15.00
Crates of 100 ten-pound pails.....	12.50

Ask for quotations on 60-pound cans.

Shipments made from Michigan, Ohio, Illinois, and Maryland factories.

A. G. Woodman Co., Grand Rapids, Mich., U. S. A.

Seasonable Suggestions:

Hoffman frames with 1 1-2-in. spacing supplied for either standard or Jumbo depth. Write us if interested.

Note that packages weighing up to 70 pounds may be sent by parcel post. If you are on an R. F. D. route it is often cheaper than express or freight on quite large shipments. We make a specialty of quick service on all such orders.

We want beeswax. We pay the highest market price. How much have you?

We supply Root's goods in Michigan. They are best known for their good quality. Our part is quicker and cheaper service.

Beginners' outfits either with or without bees. Our best equipment included with them. See pages 51-54 of the new catalog.



M. H. Hunt & Son

510 North Cedar Street
Lansing, Michigan

THE FIRST COMB FOUNDATION

Bee comb foundation is a recent product, comparatively. Previous to 1850 very few beekeepers realized the value of elimination of drone-comb. Some few did. These got straight worker-combs by cutting up the crooked combs and including only worker-cells in the frames.

The elder Dadant of the present Dadant firm well remembers this procedure, practiced together with his father, Charles Dadant.



JOHANNES MEHRING.

Not only did they remodel the combs of their own colonies but they bought dead colonies everywhere possible, locally, in spring, to increase the amount of worker comb available.

And yet they were always short of worker-combs.

It was in Europe that the first attempt at foundation was made.

Johannes Mehring, in 1857, produced crude plates of wax with the hexagonal impression. But these were far from perfect. In fact, much

drone-comb was built from them. But it was a beginning.

The waffle-iron presses of Rietsche and Given followed. The sheets became of better impression, but were still hard to ship owing to their brittleness.

The roller mills of American make were later to remedy this defect, gradually improving with continued experiment. With the roller mills came

DADANT'S FOUNDATION

DADANT'S FOUNDATION, *Every inch, every pound, every ton equal to any sample we have ever sent out.*

SPECIFY IT OF YOUR DEALER—IF HE HASN'T IT, WRITE US.

DADANT & SONS, HAMILTON, ILLINOIS

CATALOG AND PRICES OF BEE SUPPLIES, BEESWAX, WAX WORKING INTO FOUNDATION AND COMB-RENDERING FOR THE ASKING.

GLEANINGS IN BEE CULTURE

MAY, 1920

FROM SEVERAL reliable sources we have received information that sugar will be



**Sugar to be
Scarce and
High Priced.**

very scarce and high priced next fall. We have been told that there is

plenty of sugar, but that certain speculators have bought it up and are holding it until they can get their price. It is rather unfortunate that Uncle Sam let go of his control. If there is any unfair speculation or profiteering, it is not too late for that gentleman to take a hand in the matter yet. However, there is no great loss without some gain. If sugar is scarce and high priced, it will make, of course, a better honey market, and honey is about the only real competitor of sugar.



ON ACCOUNT of railroad labor troubles, resulting in express embargoes thruout the



**Shipment of
Bees and Queens
Delayed.**

country, Southern queen and bee rearers were unable to ship much by express during about

three weeks in April, and shipping facilities are not yet normal. Purchasers of bees and queens in the North, who have placed orders for early shipments from the South, should certainly keep in mind that railroad conditions have very greatly delayed almost all of the earliest express shipments. Parcel post service, which is not generally used by the queen and bee rearers, has been far from normal during this same period. Shipments of bees by parcel post is likely to grow in favor in the future, for the reason that since Jan. 1, 1920, bees and queens can both be insured and sent C. O. D. by mail.



TAKING EVERYTHING into consideration, this has been a hard winter and spring on



**A Hard Winter
and Spring.**

bees. Very severe losses are reported from some sections.

In many parts of the country a few days of beautiful spring weather, which started the bees to breeding heavily, have been followed by high winds and blizzard cold. As late as Apr. 19 Colorado and Nebraska suffered a severe blizzard. We are expecting to hear reports of

wide-spread spring dwindling. Where the bees have been well housed in cellars, or well packed, as they are farther north and in Canada, there will not be heavy losses. But last fall the high price of honey induced many beekeepers to extract too closely. In spite of warning to get sugar early, many beekeepers have had either no sugar at all or were compelled to feed brown sugar. This latter, in many cases, caused dysentery. Altho at present unable to give definite figures on wintering, the Department of Entomology at Washington reports heavy winter losses thruout the country, due to poor stores and prolonged confinement to the hives.



“A STUDY of the Behavior of Bees in Colonies Affected by European Foul Brood”



**New Light
On European
Foul Brood.**

is the title of Government Bulletin, No. 804, by Arnold P. Sturtevant. This bulletin which was

issued in March is a preliminary report of a series of investigations started in the spring of 1918.

During regular apiary work, important observations by such men as Dr. Miller, Alexander, and other authorities have led to many accepted practices based on such beliefs as the need of Italian bees, a queenless period, and strong colonies in combating the disease. Mr. Sturtevant gives a short review of these practices and theories already advanced. These he considered very important, but felt they should be backed by proof.

Altho the cause of the disease has already been worked out bacteriologically, he says there can be little further laboratory work on the development of the disease until *Bacillus pluton*, the accepted cause, has been grown in a pure culture.

Accordingly, the experiments reported were made in the apiary, colonies being inoculated by feeding them a sugar solution infected with diseased larvæ, and then a careful record kept of all important factors during the development of the disease. The use of a colored dye in the infected syrup made it possible to note where the infected syrup was first placed and where it was moved. Daily observations were made to determine the earliest appearance of the dis-

ease, the period of incubation, the symptoms shown, the rate of increase, etc.

The results of these experiments are exceedingly interesting. *Bacillus pluton* which, as in previous experiments, was found to be the primary invader, was noted in the intestinal tract of the larvæ before death, in fact with the first apparent symptoms. He believes that the intestinal tract is the primary focus of infection, while the secondary invaders appear only after death and are found mostly in the body tissues.

The period of incubation was found to be from 36 to 48 hours, altho the gross symptoms usually did not appear for three or four days, the exact time depending on the honey flow and the strength of the colony. In cases in which colored syrup was given the bees, in from 24 to 36 hours a number of discolored larvæ averaging four days old could be seen, while the larvæ younger than three days never showed any discoloration. This throws considerable light on the necessary period of queenlessness when treating European foul brood.

During the first five to seven days after infection the spread of the disease is slow, but after that quite rapid if conditions are favorable. The beekeeper should, therefore, learn to detect the disease in its first stages in order to treat it early.

The disease is evidently spread in the hives by the house-cleaning bees, and to other colonies by nurse bees drifting from one hive to another. The infective organisms are probably carried on the mouth parts and feet. Under a magnifying glass the nurse bees may be seen sucking up the juices of the dead larvæ, even those so decomposed that they were a coffee-brown and ropy. After working a short time on a larva, the bee will back off and wipe her tongue thoroughly with her front feet. Mr. Sturtevant thinks it likely that this might contaminate her so that she would carry infection to the next larva, even tho the juices of the diseased larvæ were not actually fed to the healthy larvæ. He believes the contamination of the mouth parts the primary method of spreading the disease inside the colony. When removing this affected material, he noted the bees took it some distance from the hive before dropping it.

House-cleaning was carried on with more energy by the Italians than by the hybrids, and was especially rapid in the strongest colonies. In one instance Mr. Sturtevant noticed that the presence of a new queen, tho still caged, gave an added impetus to house-cleaning. The knowledge of this fact, we believe, should be of practical help to beekeepers in treating the disease.

Italians were found to resist infection better than hybrids and could more easily overcome the disease after being infected. This resistance of the Italians he believes to be largely due to their better house-cleaning habits rather than to a natural immunity.

A heavy honey flow, he found, had a tendency to prevent infection of a colony, and

also to eliminate the disease if already present. This, he says, is evidently on account of the dilution of the infected material and the feeding of fresh nectar to the larvæ.

Altho infection is not always entirely removed by a period of queenlessness, it soon disappears when enough young bees have hatched to assist in the house-cleaning. Except in the strongest Italian colonies that are but slightly affected, requeening is necessary, Mr. Sturtevant says, in treating European foul brood. And under average conditions, it is unsafe to allow less than a 10-day period of queenlessness because of the infectious condition of the diseased material remaining. The confirmation of this one fact alone is of considerable value to beekeepers thruout the country in their future treatment of the disease. All beekeepers are greatly indebted to Mr. Sturtevant for the new light he has thrown on the disease and also to the department that has made his work possible.

This bulletin may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5c per copy.



AS SOME of our readers perhaps know, E. R. Root has just completed a trip of 8,000



Changes in Honey-producing Areas.

miles over the United States, going from coast to coast and from north to south.

While he has been over this territory several times before, this time he took a rapid survey, checking up the changes and the regional differences in the United States so far as they relate to honey plants and bee territory.

Conditions thruout the country east of the Mississippi are about the same as for years back; but winter losses in the North may cut down the yield this year, no matter how good the season may be. In the West, rapid changes, as given in our April issue, page 202, have taken place on account of the onward march of sweet clover thruout the Arkansas Valley, the Rocky Mountain regions of Colorado, Wyoming, Montana, and Idaho.

The last-named territory will furnish about the usual crop of alfalfa and sweet clover—about an equal amount from each. Montana and Wyoming are coming to the front very rapidly as bee States.

The early cutting of alfalfa in the West just as it comes into bloom (a practice that is almost universal now) has been made up and more than made up by the continuous blooming of sweet clover, which is now being grown as a pasture crop where alfalfa won't grow.

The East should understand that much of the alfalfa from the West in the last few years has been about 50 per cent sweet clover. Nor does this hurt it any; for in

former days the bottlers were blending the two. These honeys are now already blended by the bees, altho there are localities where pure alfalfa is still obtained. No alfalfa in the South will have sweet clover mixed with it.

Northern Idaho with Eastern Washington is a coming field for honey production, and a number of large apiaries are being established in favorable locations. Yakima Valley produces in favorable years large quantities of choice honey. It is reported on good authority that about 25 cars of honey were shipped from the central part of Washington during the season of 1919.

In northern California there is some new bee territory being discovered. There is a prospect of a wonderful development taking place in the next few years. The seasons are more even from year to year than they are in the southern part of the State. Starthistle honey, which some experts think is the finest honey in the world, even better than clover, is produced in central and northern California. Then there is the famed carpet grass or *Lippia nodiflora*, that is found in the Sacramento regions. All of this country is developing rapidly in fruit-growing and truck-farming. In fact, the Sacramento Valley promises to be the great garden area of the Pacific coast. More wonderful still, white clover is a very important plant in northern California, particularly Shasta and Siskiyou counties. Prof. W. A. Coleman of the University of California is authority for the statement that white-clover honey is produced and shipped by the earload from that part of the State; and white-clover honey—well, it never takes a second place anywhere so far as quality is concerned. He also says that in San Mateo County there are 75,000 acres of sweet clover, and that it is being introduced elsewhere in the State.

There is a prospect this year of a fair crop of sage honey in central and southern California, and there will be the usual flow of orange. The prospects are much better than last year.

In Arizona a great and wonderful change in beekeeping conditions has taken place. The desert plants are about the same as they were. But alfalfa, the great source of honey in former days, is rapidly giving way to the production of long-staple or long-fiber cotton that is used in the manufacture of automobile tires. The Goodyear Rubber Co. owns and operates 12,000 acres for cotton growing. In fact, cotton in the Salt River Valley, Arizona, has practically absorbed all the alfalfa area, so that alfalfa is almost a thing of the past. At first this put the beekeepers up in the air; but they soon found that cotton, while not as heavy a yielder per acre, produces a very superior light-colored honey—lighter in color, in fact, than that from alfalfa. Many are finding that what was supposed to be a calamity may be a blessing after all. Where the beekeepers had a light-amber honey be-

fore they now have a white honey and of a very mild flavor. A similar change has taken place in Imperial Valley, California, but on a much more moderate scale.

Some beekeepers of Arizona are taking advantage of the deserts, of which there are thousands of acres, and no overstocking. Few people like or can stand these deserts; but those who can are finding that wild Indian wheat, wild hollyhock, and bottom willow, besides a score of plants that yield honey and pollen the year round, build up colonies so that they are booming in March. These colonies could spare to advantage from two to three pounds of bees each. This desert country can furnish thousands upon thousands of pounds of bees in package form for the orange bloom in California. In fact, it could supply in early spring the whole Rocky Mountain regions with packages of bees to boost colonies that are below par. If interested, write the Lovett Honey Company, Phoenix, Ariz.

In New Mexico the business of wholesale spraying has all but killed out beekeeping in parts of the State, especially around Roswell—not because the trees are sprayed while in bloom, but because the sprays fall on the cover crop beneath the trees. If these cover crops are red clover, sweet clover, or alfalfa, and are yielding honey at the time, the bees are killed off by the hundreds of colonies. Precisely the same thing has occurred in parts of Colorado.

In and near Uvalde, Texas, the once famed paradise of bees, the conditions are much the same as they were twenty years ago. The mesquite, the catclaw, and guajilla hold sway as formerly; but they have their good and bad years. Twenty years ago this territory was covered with beekeepers, and all of them were producing good crops; but a series of bad years intervening put many of the bees and beekeepers out of business. The territory is rapidly recovering, and now there appears to be a prospect of honey from these desert sources. Broomweed, another important desert plant, is scattered over the southern and eastern part of the State.

Texas, like Arizona, on account of the high prices, has gone wild over cotton. A large part of the cultivated land is being turned into cotton, apparently, northeast of the San Antonio. Dry farming is practiced mainly, and cotton thrives; and where cotton grows well will be found bees. While many desert plants like broomweed grow all thru this area of central and northeastern Texas, cotton is the main source of honey.

Honey from cotton is floral honey only in part. Most of this honey is a secretion that the bees gather from the leaves of the plant.

In later issues Mr. Root hopes to go into details, with pictures, pointing out some good bee territory not occupied by bees. Irrigation and sweet clover are doing wonders in the West, and Gleanings hopes to keep its readers posted.

THE Long Idea Hive— Oh, what a name! Is it a long hive or a long idea? Altho the name is not descriptive, yet it has stuck for nearly 50

years. For the benefit of some of our more recent readers I will say that the hive in question is practically a three-story ten-frame hive on a horizontal plane all spread out in one story. In other words, it is a 25- or 30-frame hive, and hence the name— Long Idea.

This hive was exploited as early as 1865, revived in the early 70's, dropped again and revived once more in the 80's; dropped and revived again in every decade until, like Banquo's ghost, it will not down. Perhaps the man who used it most continually, and for the greatest period of time, was the late O. O. Poppleton, of Florida, who began using it in the early 70's in Illinois, and later continued to use it along the St. Johns River, Florida, almost to the day of his death, which occurred Oct. 4, 1917. In 1913, when I went thru southern Florida I ran across the Long Idea Poppleton hive in numerous places. There were a few who got a vision of its possibilities; but most beekeepers after seeing the thing condemned it, even before trying it. Several said they did not see how any intelligent beekeeper like Poppleton could use such a monstrosity, and even I began to pity him till I saw

LONG IDEA HIVE AGAIN

*Its Value to the Queen Breeder in
Control of Swarming One of Its
Excellent Features*

By E. R. Root

For certain limited uses it has features the discussion of which will help us to clear up the swarming problem. One thing sure—that a thing that will die and come to life again, and keep on dying and as often come to life again every few years, must have some value. In any case it should be clearly understood that its use is limited to the production of extracted honey and queen-rearing. It is entirely unfitted for the production of honey in sections, and not adapted to the needs of large honey-producers.

As a let-alone hive it has no equal. For women and old men, or anyone else who cannot lift heavy supers of extracting combs, it is ideal. For the fruit-grower, the man who has bees only for the purpose of pollinating his fruit trees, it is nearly perfect, because he wants something that will work for nothing and board itself, and that will require a minimum of labor.

Having now made it clear that I am not advocating this hive for general adoption, I shall proceed to elaborate more upon its merits and where it can be used to advantage.

Merits and Use of Hive.

The illustrations given herewith show

there was method in his madness.

Let me say right here, before I go further, that I am not advocating the hive for general adoption.

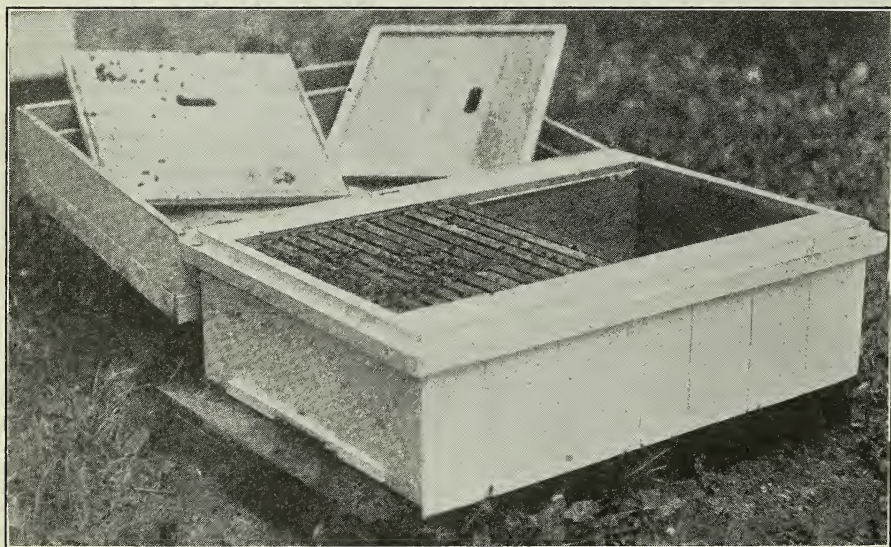


Fig. 1.—The Long Idea double-walled hive, holding 25 Langstroth frames, as used by the Pritchards for cell-building. The double walls and tray of packing give ample protection during winter. It is a very easy operation to open this hive and get at any part of the brood-nest because there is no super or upper story in the way.

several Long Idea hives all in one row. The late Mr. Poppleton said that if he were going to start again he would use the Langstroth frame instead of the American. How many frames shall it have? Twenty-five are enough for a queen-breeder, but 32 is a better number for the extracted-honey producer; because if he should ever have a honey flow large enough to require more than 32 frames he can put on one, two, or three upper stories of ordinary ten-frame hive

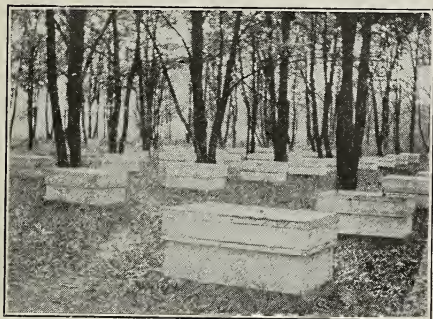


Fig. 2.—General view of the Long Idea cell-building hives. There are 50 in all, not one of which has cast a swarm during the last three years, while every one of the $2\frac{1}{2}$ -story colonies of like capacity in standard Langstroth hives has swarmed.

bodies, and the combined width of these stories side by side will be exactly the length of a 32-frame hive body below.

I said this hive is well adapted to old men, women, and girls, or to those who from weakness of the back or otherwise are not able to lift heavy loads. With this hive there is nothing heavier to lift than a single Langstroth frame which, when filled with honey, seldom weighs over $6\frac{1}{2}$ pounds. It is very easy for one to tilt the lid back like opening a trunk, sit on one end of the hive, and work toward the other. (See Fig. 4.)

The brood can be placed at the front end, with the surplus combs in the other. Or the brood can be placed centrally, leaving the store combs on either side. In that case the entrance should be on the side rather than on the end of the hive. When run for the production of extracted honey the combs at one end of the hive can be extracted, the combs replaced, and in a week or ten days later, the combs from the opposite end extracted. No hard-and-fast rule need be applied. The entire manipulation requires no heavy lifting, because the combs one by one can be removed and placed in a box or wheelbarrow and run to the extracting-house to be extracted. A bee-escape or queen-excluder could be used; but these would have to be mounted in a tight-fitting division-board, because the hive, if divided at all, would have to be divided on a vertical plane. As a matter of general

practice it is not necessary to use either bee-escape or queen-excluder.

When the time arrives to put the bees away for winter the brood-nest may be left any size desired. It should, however, be contracted to as small a space as possible and yet allow the requisite amount of stores for the size of the cluster of bees. A tight-fitting division-board should then be placed on each side, and leaves or other packing material poured in to fill up the empty space. A tray of packing material placed on top under a deep telescope cover completes the preparation for winter. If the two sides of the Long Idea hive are made double-walled and the space on either side of the cluster is filled with packing material, the colony will be well protected. But if one does not wish to go to that expense he can put the colony into an eight-frame hive, place this in the center of the Long Idea hive, and then put in packing material around it. There should, of course, be provision made for an entrance leading from the inner hive to the outside.

While the first cost of the Long Idea hive is more, it takes in the equivalent of more than a three-story ten-frame Langstroth hive. It does not require the use of additional supers, queen-excluders, honey-boards, nor any special winter hive. Taking the entire season thru, it cuts down the cost of the apparatus, eliminates all lifting of honey, and, what is of considerable importance, it almost entirely eliminates swarming. And this brings me to the question of how it prevents swarming.

How It Controls Swarming.

Before I answer the how and the why, let me relate something of our own experience with swarming at our queen-rearing yards under the control of Mell Pritchard. As

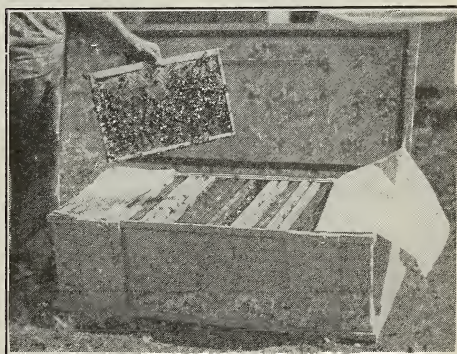


Fig. 3.—The Long Idea hive as used and recommended by Eugene Baker, near Los Angeles, Calif.

every queen-breeder knows, in order to get strong and vigorous baby queens in large cells it is necessary to bring about a supercedure or swarming condition in the colony. If there is not a light flow of honey coming in, artificial conditions should be created by

feeding a small amount of syrup every day. This feeding starts up breeding, with the result that the colony will prepare to swarm by building cells or accepting artificial grafted cells.

At our queen-rearing yards, during a honey flow, we have always had a great deal of trouble from swarms coming out of our cell-building colonies (usually two-story ten-frame) just at a time when there is no extra help to take care of them. Mr. Pritchard has often been driven to the point of desperation by having five or six swarms come out of his regular two-story Langstroth hives in one day and cluster up among the basswoods 20 or 30 feet from the ground. After one such exasperating experience he came to me one day about three years ago and said he would like to try that Long Idea hive for cell-building. He had read what I said of it, and he had come to the conclusion that swarms would not issue from it as they would from two- and three-story hives when tiered up one above the other. I said:

"Mell, give me your reasons."

"Bees swarm," he said, "because in an ordinary ten-frame hive the queen is cramped for room. After filling the eight or nine frames she skips the two outside frames because they are next to the cold sides of the hive. She does not like to cross the one or two inches of honey up above the brood; so she stays in the lower story."

"But, Mell, when the queen is crowded badly, would she not go up into the upper story and lay there if she could?"

"She would if you coaxed her up with a frame of brood," he replied. "But unless that is given her she hesitates to cross the two inches of honey, the seven-eighths top-bar, the three-eighths bee-space, bottom-bars of the frames above, a bee-space between the bottom-bar and the comb above. That seems too far away. The queen is, therefore, practically confined to a circle of brood on eight combs and, as a result, starts cells. On the other hand, when a colony is in a Long Idea hive the queen can occupy a dozen or more combs, the division-board being simply shoved over far enough to permit of the queen's largest capacity."

The upshot of our conversation was that Mr. Pritchard prepared specifications for 50 Long Idea hives with a capacity of 25 frames. The sides of the hive, or what would be next to the end-bars, were double-walled. A deep cap to provide for a large tray to hold packing material during the winter was hinged like the lid of a trunk.

Now, dear reader, take note that Mell's contention was borne out in actual test for three years. During that time not one of the Long Idea hives cast a swarm, notwithstanding they were crowded to their utmost for cell-building, and nearly every one of the regular two-story hives run for the same purpose swarmed just as they always had done; so you can see that practice bears out the theory.

The superintendent of our wood-working shop, a backlot beekeeper, was so impressed with this hive that he had an extra hive of this pattern made for himself. He says it does not swarm, and yet gets more honey than anything else he ever tried.

I was talking with G. S. Demuth in California a year ago during the progress of those beekeepers' short courses; and, without knowing what Mell had said, he advanced precisely the same theory.

Mr. O. O. Poppleton told me that one of the reasons why he adopted the Long Idea hive was because it eliminated almost entirely the swarming tendency on the part of the bees, and because, being an old man, he could not lift heavy supers. He it was who told me some five or six years ago he had discovered that a queen will expand her egg-laying capacity **laterally** from comb to comb more readily than she will expand vertically into a second story. "And then," said he, "Mr. Root, the main cause of swarming is a too restricted space for breeding."

In the February issue I explained a scheme that will go a long way toward making a queen expand the brood-nest vertical-



Fig. 4.—A 32-frame Long Idea hive in the apiary of C. F. M. Stone, La Manda Park, California. Mr. Stone, while not an advocate of such a hive, is more than willing to have a few of them put in his apiaries to be tried out. The two side cleats support the telescoping cover, and, projecting out at the ends, make it possible for two persons to pick up the hive. In Mr. Stone's hives the entrance is placed on the side rather than at the end. For the production of honey the side entrance is, no doubt, better.

ly in a two-story hive without any action on the part of the owner; but even that scheme will not be as good for the queen-breeder as the Long Idea hive.

One can naturally see, from what I have already given, why the Long Idea hive eliminates swarming; why it is especially adapted to cell-building; why it would be ideal for women and children, and men who

have gone past the age when they can lift heavy supers. Practically the entire cost lies in the first investment of the hive itself. After that there is but very little expense.

Not for the Average Producer.

Now to the important question, "Would such a hive be practicable for the average honey-producer—the man who has plenty of brawn and muscle, and who may desire to practice keeping bees at out-apiaries, and at the same time do something in the line of migratory beekeeping?" In answer to this I would say emphatically no. In California where migratory beekeeping is getting to be quite common this hive would not answer. However, Mr. Poppleton, in his day the largest migratory beekeeper in the United States, said he liked these hives because when he moved he could pile them up in his boat, one on top of the other, like so much cordwood. To do the loading and unloading he hired negroes. All he had to do was to boss the job. But for the average man who can't hire help, white or black, the Long Idea hive takes too much room or bulk in a wagon or boat and is too heavy to lift alone. When using a regular standard hive, the colony can be confined in one story of small size and weight, and the rest of the equipment can be carried as a separate load.

But there is another thing yet to be considered by commercial beekeepers. I do not know but there are some, including myself, who fear that bees do not store honey as well **laterally** as they do **vertically**. Heat naturally rises, and bees are inclined to move upward with their stores. On this point, however, our old friend Poppleton thought there might be a slight difference in favor of vertical storage; but he added that the difference was but slight.

But the chief objection to the Long Idea hive is that it is not a standard save in the size of the frame.

There is another objection. A whole super of extracting-combs cannot be cleared of bees with a bee-escape, as can be done with one or more stories of a regular Langstroth hive. While a bee-escape can be used in a division-board in a Long Idea hive, the combs would have to be handled **individually**. On the vertical or tiering-up system the combs can be handled in groups of ten or eight according to the size of the brood-chamber. Moreover, a super of such combs is handy for toting to and from the extracting-house. In other words, the combs can be handled in lots of ten, while with a Long Idea hive the combs must be put in a box on a wheelbarrow **one by one**, and on arrival at the extracting-house must be picked out of the box or carrier **one by one**.

Recapitulation and Conclusion.

To recapitulate, the tiering-up or vertical system is better adapted to the commercial honey-producer, while the Long Idea hive, or horizontal system, may be better for the

queen-breeder, and for women and children or old men, or for anyone else who cannot do heavy lifting.

When I have explained the merits of the two systems to the commercial honey-producer, I have heard more than one of them who had got past the age of 50 or 60 say: "I am beginning to see the day when I must give up heavy lifting. The elimination of swarming and the elimination of hive-lifting make the Long Idea hive look mighty good to me. I will try a few."

But down deep in his heart the man who has a thousand colonies or more, even if he is 50 or 60, knows that he cannot afford to change over. It is more practicable for him to hire a husky young man, or several of them, to do the lifting for him. During ordinary times he can do this if he cannot now.

If the commercial honey-producer thinks he requires a brood-nest larger than a ten- or eight-frame Langstroth brood-nest, he



Fig. 5.—Mell Pritchard and his son Arlie Pritchard in the basswood apiary where 50 of the Long Idea hives are in successful use. Both are expert queen-breeders.

had better adopt a Jumbo hive. Or, if he feels that he does not want to fuss with two sizes of frames in the apiary he had better use the 13-frame Langstroth hive when his frames will all be Langstroth and all of a size and interchangeable. The backlotter, if he favors the Long Idea hive, had better try one or two at most, and if he likes these use more later. The average beekeeper should stick to the ten-frame Langstroth brood-nest, which, when the frames are properly wired, will come near solving the hive question.

IN Wisconsin beekeeping has long suffered from lack of organization because people have looked upon it as a more or less uncertain business, and many of our best beekeepers have not conducted the business in a thoughtful and businesslike way. The present development is simply a forward movement that comes with the healthy growth of any similar industry. Beekeeping has always been a big "small" industry but lacked development, and a lack of business co-operation among beekeepers has prevented its organization. Beekeeping is now in its ascendancy because it was greatly stimulated thru conditions brought about by the war. The uninformed, cut off from the usual supply of sugar, have become acquainted with a better sweet and the possibilities of the humble bee. Furthermore, the business man, who ordinarily thinks of every product from a purely financial standpoint, has been educated in the future of beekeeping and honey production.

What Is Necessary to Membership.

Eight thousand people, more or less, own bees in Wisconsin; but many of these people are also running farms, and the bees are but one of the many side lines kept on the general farm. Because of this fact it is not surprising that so few persons have

ORGANIZATION WORK

The Building of Strong, Permanent Associations Demands Some Incentive to Membership

By Prof. H. F. Wilson.

there must be some strong incentive to membership. In our case co-operation will make incentives.

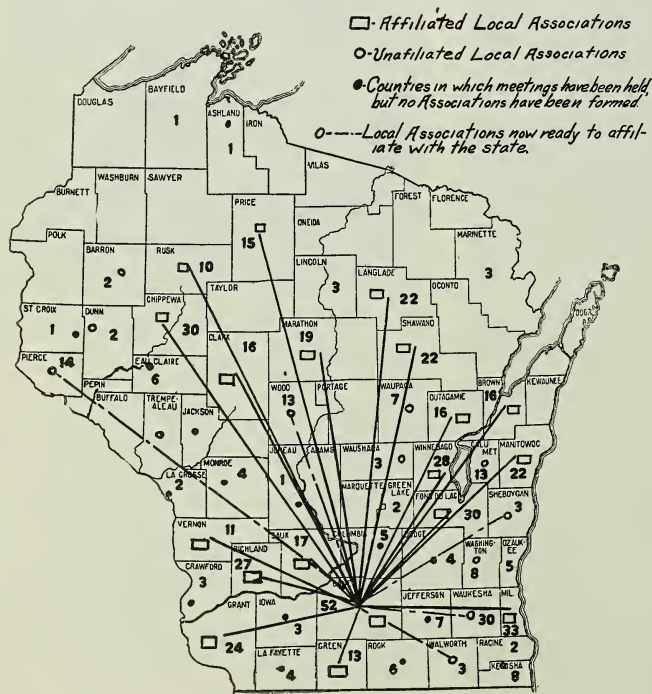
Beekeepers first rallied to the support of the National organization because there was an urgent need for protection. Later, when the immediate cause of that rally was taken care of, the beekeepers became more taken up with local affairs and the support to the National fell off. In the same way local and state associations thrive according to the returns the beekeeper receives. **No association of beekeepers can continue indefinitely unless there is a tangible asset to membership.** Many old-time beekeepers attend the association meetings to meet and talk with old friends, but the younger generation usually consider matters upon a basis of financial returns.

How the Work Began.

Early in 1916 while studying the conditions in this State, it became evident to the writer that, in spite of wonderful opportunities, the beekeeping industry had been declining for a good many years and would continue to decline, unless some strong measures were taken to check what might prove to be a real beekeeping disaster. Inquiry among beekeepers showed that bee diseases, winter losses, and lack of protection for the bees in late fall and early spring are the main causes of the destruction of the bees and a decline in the industry.

It then became evident that some plan must be developed which would interest the beekeepers in co-operative effort for checking the ravages of disease and produce better beekeeping methods. During the winter of 1916-1917 over 2,000 circular letters, containing a list of questions, were sent out to beekeepers. Sixty replies were received, and four men were willing to arrange local meetings.

Personal talks with a number of the bee-



keepers brought out the fact that many were discouraged, and they did not believe that any organized effort would benefit them. Others were anxious to do something, but did not know what to do. The State Association lacked power to help, and the industry was drifting along at the mercy of the winds. After much correspondence with beekeepers and the officials of various State organizations, a plan for getting the co-operation of the beekeepers was decided upon, and we have followed that plan of organization work successfully to the present time.

Fortunately, plans for reorganization had already been started in Wisconsin when the United States entered the war, and the stimulus brought on by the sugar shortage helped as no other factor could; but had not the government officials also been ready and given us free help, I doubt whether we could have advanced as we have. Our first efforts were certainly most discouraging, and it is no discredit to all who helped, when I say that, had we given up at any time during the last year, the results from the standpoint of organization would have been almost nothing. Of the 28 organizations formed during the first two years of our work 23 have died and have been completely reorganized. Several have been reorganized three or four times.

Meetings and Schools.

The best way to interest people in helping to build up an organization is to give them an active part in the work. This we have done, by giving every beekeeper a chance to do active work in the State Association and by showing the beekeepers themselves that they alone are responsible for improving conditions within the State. We held meetings in every county where the beekeepers were interested and have succeeded in convincing most of the big beekeepers as well as others that they can not succeed alone and would surely fail in the end, if they did not organize and co-operate in fighting foul-brood diseases and in buying supplies and marketing their crop. We have also been able to convince the best beekeepers that they could be helped in an educational way.

With the aid of men from the beekeeping department at Washington one-day meetings have been held as follows: 1916, none; 1917, 21; 1918, 75; and 1919, 62. The average attendance at these meetings has been 22. A total of 53 counties has been reached.

In August, 1919, we held a beekeepers' Chautauqua at Madison with a registered attendance of 161 people. Three years ago 25 people could not have been brought together for such a meeting.

We are also conducting a series of three-day bee schools wherever 25 beekeepers will agree to come. Eight have been held and twelve more are arranged for. The average attendance at these meetings is approximately 30, with 40 in one case. As high as 2,000 colonies of bees have been represent-

ed at one school. To educate, to co-operate, to organize, and to improve is the keynote of every meeting and every school. The beekeepers themselves are behind every movement, and their whole-hearted co-operation has made the work a success. Close co-operation exists between the State Beekeepers' Association, the University, and the State Departments of Agriculture, and in every forward movement one helps the other. Every time we write a letter to a beekeeper who is not on our list, we inclose a nice little card inviting him to join the State Association. The response to these cards has been unusually good. A new plan of organization adopted by the State Association in 1917 has also done much in developing a new interest in organization work. The State society is made up of the parent association with state-wide interests and affiliated county or district societies with more local interests.

Local and State Associations.

Thru the Beekeeping Extension Division of the College of Agriculture, local associations have been formed in 30 different counties and districts, and 19 of these have affiliated with the State society. In order to affiliate with the State Association a local society must have 10 members on its rolls who are also members of the State Association. The other members of a local are not required to belong to the State Association; but, as a rule, when locals become affiliated, the dues of the local are made to include State Association dues, and each local member automatically becomes a state member. This plan also provides for a board of managers, who govern the policies of the Association. This board is composed of delegates, elected one from each affiliated association, and exclusive of the president and secretary of the association who are ex-officio members; its members constitute a nominating committee for the selection of state officers. This makes the Association democratic and gives each local an equal interest in the management of its affairs.

Now as to the result: The Association has increased its membership in three years from 100 to more than 550; 30 locals have been formed with a total membership of 1,150 members, and 19 of these with 625 members have become an active part of the mother organization. Members of local associations are benefited thru co-operative buying and marketing and educational meetings. Members of the State Association in addition receive each month a copy of Wisconsin Horticulture, in which there are four pages of beekeeping matter, and also receive the aid of the State Association should occasion require. Because of organized effort the State Association was able to have a new bee law, with a substantial appropriation, passed at the last legislature with but a single dissenting vote. The State Association has also secured the co-operation of the state and national marketing bureaus and thru the State Entomologist's office the

state marketing commission will receive and list in a weekly letter, sent out to commission firms, all offerings of honey. This will help every beekeeper who does not have a local market for his honey to find a market for his crop.

State, University, and Beekeeper Co-operate.

Fortunately, the University and the State Department of Agriculture have their lines of work definitely outlined and separate, and it has been possible for all parties to work in close co-operation.

The regulatory work is by law in the State Department of Agriculture, while the educational work is given to the College of Agriculture of the University. By agreement the organization work in connection with the State Association has been left to the University, but the State Department will in general not attempt clean-up campaigns in any district where an organization does not exist. This is a very important consideration because it means that the beekeepers in any locality can very easily get State aid, but they must request assistance and agree to give united support in helping to eradicate disease. Furthermore, the burden of success in each campaign is in the hands of the beekeepers themselves. The State Apiary Inspector does not have sufficient funds, nor it is possible always to get competent inspectors to cover the entire State at once. A system that is satisfactory to all parties concerned, however, has been worked out whereby a local organization may select its own inspector as follows: Three men are elected by the local from its members, and they are compelled to pass an examination conducted by the State In-

spector under civil service rules. The person receiving the highest rating is then appointed a deputy inspector for the county or district in which he resides. In case of special need an inspector from the State office can always be secured.

Co-operative work is now carried on to a greater extent thru H. L. McMurry, special field agent, working on a joint project between the College of Agriculture, the United States Department of Agriculture, and the State Department of Agriculture. Mr. McMurry acts as State Apiary Inspector from May to October and Special Extension Agent from October to May.

We are able to keep the beekeepers informed of our meetings by a thoroly planned advertising campaign, which extends not only to all parts of our State but reaches also adjoining States, as demonstrated by the inquiry received from outside the State regarding the three-day bee schools. A complete list of beekeepers, so far as we are able to obtain addresses, is filed in our office, and whenever a meeting is to be held in any locality all beekeepers in that county are notified.

Three weeks before each meeting, a special write-up with a program is sent to every newspaper within a given area, and this is followed two weeks later with another write-up calling attention to the importance of the bee industry in that particular part of the State and the value of a co-operative organization. However, the biggest advertisement is to hold successful meetings and send the attending beekeepers away satisfied.

Madison, Wis.



Wisconsin Beekeepers' School and Chautauqua of 1920 held at Madison.



REARING ONE'S OWN QUEENS

A Very Sure and Practical Method of Getting Excellent Results

[This paper was read by Jay Smith of Vincennes, Ind., at the last meeting of the National Beekeepers' Association held at Buffalo in March. It was voted to request both Gleanings in Bee Culture and the American Bee Journal to publish this valuable paper.—Editor.]

At the risk of being accused of "harping," I am going to state that few of us realize the importance of having vigorous young queens at the head of all of our colonies. Elisha Gallup said, "Around the queen centers all there is in apiculture." Doolittle said, "Upon no other one thing does the honey part of the apiary depend so much as it does upon the queen." Dr. Miller says, "The queen being the very soul of the colony, I hardly consider any pains too great that will give better queens." Quinby said, "Too much importance cannot be attached to the necessity of keeping each hive supplied with a good queen." Dr. Phillips says, "Unless the queen at the head of the colony is a good one, it is useless to expect that colony to be productive."

We hear a good deal of discussion as to the best strain of bees, and as to the advisability of breeding from the queen whose colony produced the most honey. The question frequently comes up, "Which are best, the goldens, three-banded, or leather-colored?" While all of these are important, yet I believe what is far more important is, **how the queen is reared.** To rear the best queens it is important that they have the best care from the time the larva hatches from the egg until the queen is mated and laying.

The honey-producer who raises his own queens has the following advantages over the commercial queen-breeder: He requires but a limited number; he can choose the time of the year when the honey flow is just right; and he will usually find it practical to introduce the queen-cell to the colony instead of allowing the queen to become mated from a nucleus hive, thus saving the work and expense of nucleus hives and the risk in introducing the laying queen. The disadvantage of this system is that it is necessary to keep the colony longer without a laying queen. But if the cells are produced as the honey flow is coming on, the colony that is made queenless will lose little, for the workers that would have hatched if their laying queen had been left with them, would not become fielders till after the honey flow was over. Then again, if one should have European foul brood in the yard, this method of requeening would be

the very best method for eradicating the disease.

I shall not attempt in this short article to give a complete description of queen-rearing, but shall dwell upon some features that I believe should be emphasized. For the one who rears over 100 queens per year, I believe, when all things are considered, that the grafting method is to be preferred.

As the honey flow is coming on and the stronger colonies begin to show signs of swarming, and the combs begin to drip nectar when shaken, it is time to get busy at queen-rearing. The method of getting the grafted cells accepted by the use of the queenless and broodless colony is good, but the swarm box has many advantages, provided you have a good cellar where the bees may be kept warm on cool nights and be kept cool on hot days. As most are familiar with the process of grafting, I shall not dwell on that further than to state that I believe much better results will be obtained by the use of royal jelly. Some claim that they get good results without using it, but I never could. The jelly should be diluted with clear water till it is as thin as royal jelly surrounding a larva that is just hatched. J. W. George of El Centro, Calif., informed us that royal jelly can be bottled and kept from one season to the next. I tried this the last season and find it one of the most convenient little tricks of the trade. A shallow screw-cap jar with a wide mouth is suitable for storing this jelly. If you have no such jar, you might be able to find one if you will rummage around in your wife's manicuring outfit. The ladies usually have these little porcelain jars, filled with pink salve or freckle dope or something. You can clean this out and put the contents into a tin can and present it to your wife with your compliments and make off with the little jar. Sterilize it thoroly by boiling, for the bees seem to object to the smell that comes with it. This jar, together with a jelly spoon, may be carried in the pocket, and when you are working among your bees and find any royal jelly you just pull this jar out of your pocket and can it right there. From a colony that is preparing to swarm you can get enough to graft several hundred cells. For filling the swarm box a tin funnel is convenient. I prefer a swarm box large enough to hold five frames, but only two frames are used. These are placed one at each side, leaving the space in the center to accommodate three grafted cell bars. In filling the swarm box, it is well to place it on scales so that the weight of the bees may be accurately known. Between four and five pounds of bees should be used. These must be taken from a strong colony in order that

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the brood left in the hive will not be neglected. The frame containing the queen is set at the side of the hive, and after the swarm box is filled she is placed back in her hive again. This box is filled just before noon and the cells grafted about four p. m. Usually, the bees confined in a swarm box will not take sugar syrup, but if honey diluted with one-fourth water is given they take this readily. This is given in a Mason jar with perforated cap and is placed in the hole that was used for filling the box with bees. A swarm box prepared in this manner will accommodate 60 cells. It has not been an uncommon occurrence to have every cell accepted and every one finished into long perfect cells. As a rule, however, we get about 55 accepted and, when given to a finishing colony, they usually find one or two more that do not suit them and they tear them down. The bees should be left in the swarm box till noon the next day, or they may be released any time during the afternoon of the following day. In the cellar or basement the bees should be kept in the dark. I had a basement made of concrete, and we stacked up extracting supers to the ceiling to keep out the light. A room was made in this way with the opening facing the wall so that no direct rays of light could enter. In this "dungeon" the bees remained quiet and kept right at the task in hand. The best way to get cells completed is over a queen-excluder in a two-story hive, with a good laying queen in the lower hive. But in order to get the best results, this hive must be rousing strong. It is well to have both hive bodies **completely filled with brood**. Extracting-supers may be put on top of all. This will necessitate some lifting at times, but it is well worth it. One bar of from 15 to 20 cells is given to a colony to be finished. The cells should be left with this colony that finished them until the tenth day after they were grafted. They will then be ripe and will hatch some time late in the afternoon of the eleventh day. These cells should be handled very carefully on the tenth day or cells will fail to hatch or crippled queens will be the result. The colonies you wish to requeen should be made queenless at least 24 hours before giving them a cell, and, if any trouble is experienced from the bees tearing down the cells, they should be made queenless 48 hours. However, if the nectar is coming in and the weather is fine, 24 hours will be long enough. But I can almost hear this question asked, "Why not use a cell-protector?" Because if you wish to get the **best** results in rearing the **best** queens, you should not use them.

After conducting some experiments along that line, I believe that many do not realize that one of the cardinal points in rearing the best of queens is "proper incubation." To secure perfect incubation of queen-cells

the bees must have free access to the cells at all times. Cells will not hatch perfect queens at all times, if they are allowed to hatch in cages or cell-protectors, for the reason that the bees cannot cluster around the cells and keep the temperature just as it should be. Where the bees have the opportunity, they will closely cluster about the cell, and just before the queen is to hatch they will remove the wax, leaving the bare thin cocoon thru which the virgin queen may be seen moving about. The cell cannot have this care if placed in a cage or cell-protector. Again, it is of the utmost importance to have the virgin queen hatch among the bees, for a virgin that has just hatched is a very frail, weak affair and needs all the nursing and attention she can get if queens of the first quality are to be secured. The method just described, if properly carried out, eliminates all doubtful features. If it is desired to use nuclei, the same method is employed, except that the cell is given to the nucleus instead of to the full colony. This will necessitate introducing the laying queen to the colony, which is another story.



THE BIG NEED IN THE SPRING

An Abundance of Stores Means an Abundance of Workers

The importance of plenty of room for queens to lay, and especially the need of abundance of stores for the bees to turn into bees in the spring, is not fully realized by those who keep bees. For some years it has been my practice, when extracting in the fall, to save combs only partially filled and capped; and in the spring, after taking away the winter packing, to raise the brood-chamber and place a hive body containing these frames of honey under it. The abundance of room supplied held back swarming till the flow of honey from white clover, and the honey given stimulated the queens to lay to their utmost capacity.

In the fall of 1918, when packing my bees for winter, I gave six colonies each an extra brood-body containing ten of these partially filled combs of honey. When I took off the winter packing late last spring, I found one of these colonies with the upper brood-body well filled with brood, and six frames below with plenty of brood. This colony last year (1919), which one of my neighbors who has long kept bees said was one of the poorest seasons he had ever seen in Indiana, gave about 120 pounds of extracted honey.

If it requires a frame of honey to produce a frame of brood or bees, then hives with six frames of honey can not produce more than average colonies of bees; while 16 frames of honey, with the right queen, may

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give us 16 frames of brood or bees and a bumper crop of honey.

The abundance of honey, no doubt, is the leading factor in getting queens to lay in the lower brood-body in addition to filling the upper brood-body. May not capped honey in the lower brood-body also influence the queen to go below and lay?

In the poor year of 1919 my bees gave about 45 pounds per colony, with 61 per cent increase, which was as well as or better than last year. Our bees have greatly helped us to meet the H. C. L.

Brownstown, Ind.

D. F. Rankin.

DEFENDS THE TRAILER

Reasons Why Mr. Taylor Prefers the Trailer Rather Than the Truck

We were, I believe, the first to make use of a trailer in the bee-yard, at least I never heard of a trailer or saw one mentioned in any of the bee journals until we bought ours. It is a two-wheeled one and costs about \$75.00. We run three outyards of about 500 colonies and use the Ford car only because it is the cheapest and lightest for getting over the hills to and from our yards. We use two cars, but have one on purpose to hitch the trailer to. We have an extracting outfit at each yard and when extracting take home a load each night to Paris where we store and insure until we ship. If we do not have a load to take home, we just draw a bolt and leave the trailer in the yard until we want it.

Some have said that a trailer is hard on

the auto. I say that it all depends on who is at the wheel. We have been using ours with the same car for five summers and have never paid one dollar for expenses caused by the use of the trailer. By reckless driving one can use up a car in six months without a trailer, but by careful starting with a load and by avoiding ruts and bad places I cannot see that the trailer hurts the car at all. We can easily take 1,500 pounds on a load, but the driver should start off easily and keep his eye on the road ahead and go slowly over any bad places in the road. Where it is good and level we go 20 miles an hour with a load. For moving bees there is nothing better. We can take twenty 10-frame Langstroths to a load, and one can hardly feel any jar. Then it is so handy to take empty supers or crates or pails or any light material we may want from one yard to another. When not in use the car can be used for pleasure or running light to the yards where a truck would be too slow and clumsy.

The main objection to the truck is the high cost and the fact that it can be used only for hauling loads. It would be too clumsy and heavy to use daily going back and forth to the yards; and then the interest on the outlay, the wear and tear, the insurance and the storage (with us it would be stored about eleven months in the year), would amount to more than the hire of a truck for the two weeks that would be required for doing the heavy hauling. By making a long day we could draw home all the honey in a good year from any of our yards in two days, our farthest yard being nine miles from Paris where we store. This



A yard that Mr. Taylor's trailer serves.

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applies only to beekeepers on a small scale, those having 500 colonies and under.

Where they have colonies by the thousand and are moving bees every few months to different locations to catch the flow, a truck or trucks might be better; but, in our locality and with the number of colonies we keep, I want you to understand in cold black ink that we have no use for a truck.

Paris, Canada.

Alex Taylor.

SHORT CUTS IN REQUEENING

Annual Requeening and Packing Cases Used as Protection for Mating Boxes

Beekeepers who operate several hundred colonies of bees partly in outyards, with little or no help, can appreciate the necessity of eliminating any manipulations in requeening that are not strictly necessary.

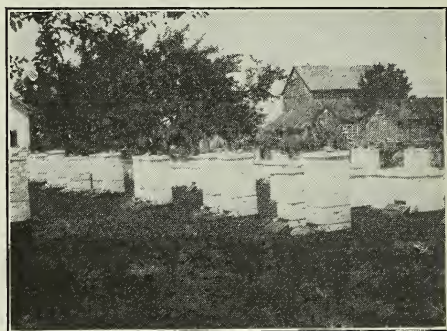
I have a fairly uniform strain of bees, with all the queens Italian, but an average of 10 per cent mismated. In requeening my practice the past two seasons has been as follows:

About a week before the end of the main honey flow I kill all queens that are mismated and all queens that have not produced an average crop and all two-year-old queens, altho the latter are all good queens except for age. All the colonies whose queens are thus killed are permitted to raise queen-cells which are destroyed after eight or nine days. At the same time I go to my colonies that had good two-year-old queens and mark all frames with queen-cells. One marked frame is left in each hive; the rest with bees, brood, and queen-cells are used for colonies needing new queens. At the end of four weeks all colonies are looked into to see if there is a young queen. If she is present she should be old enough to have been laying eggs for a week. Consequently, it is only necessary to find eggs or sealed brood, and therefore a whole yard may be examined in a short time.

The first year this plan was tried in my apiaries, I found 22 per cent of the queens lost; so this season, I made 30 extra two-frame nuclei for every 100 colonies requeened. These two-frame nuclei were made by taking one frame of honey and one frame of bees with the brood and one or more good queen-cells and placing in each of the nucleus hives. The entrance, a $\frac{1}{2}$ -inch auger hole, was closed with green leaves tight enough to last two or three days before it would be dried out sufficiently for the bees to eat their way thru if I did not get time to open it. Of course, the nuclei must be protected from extreme heat and cold.

In due time there ought to be at least 20 laying queens out of the 30 extra nuclei. These are used and introduced into the colonies that are queenless. But because these

colonies have been queenless a long time and all the bees are old, it is a waste of time trying to introduce any queen to them as they are. Therefore, after having examined a whole yard and having made a record of all the colonies that are queenless, all such colonies are given three or preferably four frames of brood in all stages from other colonies and again allowed to build cells from the brood given them; and after eight or nine days enough laying queens from the nuclei are caged in Miller cages and taken to the queenless colonies and introduced in the usual way, after having destroyed all the cells these colonies may have built on the three or four combs given. These cells are destroyed quickly and thoroly by shaking the bees off the combs to make certain that no cells are missed. The colonies are now in condition to accept the queens, especially if four frames of bees and brood have been used so that plenty of young bees have hatched. If



This yard in 1915-16 contained 50 colonies in modified Long Idea hives, with supers, and packed all the year round as shown in the back center of picture. As a result of this experiment, Mr. Hasinger has all his bees in the modified Long Idea hives today.

only one or two frames of brood are used, it seems there is too large a proportion of old bees, and in many such cases the bees will not accept the queen, especially if no honey is coming in.

There are only two examinations necessary for all colonies that were average producers and that had Italian bees. First, to find the queen and kill her. Second, examine a month later to find eggs or brood. The colonies that had inferior or mismated queens would require three examinations. The additional examination is to destroy all their queen-cells and give a frame with cells from a better colony. All colonies found to be queenless will require six examinations as the whole process must be repeated.

Four or five of the colonies may be found with laying workers. All the combs that have laying-worker eggs or brood are removed with the bees into a super or hive



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body and set above a queen-excluder, over a good strong colony with a laying queen. In place of the laying-worker brood-combs there are given at least four or five combs of brood, larvæ, and eggs, from normal colonies, the queenless colonies being allowed to build cells which are destroyed nine days later when a laying queen is introduced.

In looking thru a hive to find the queen I have been most successful by first removing two frames from the center of the hive and leaving them outside while examining the balance of the frames with this large gap in between. This works especially well with hives like the Long Idea and with queens that are not inclined to leave the brood while the combs are being examined. Those queens that are inclined to leave the brood when the combs are examined may usually be headed off by removing the two frames of brood from each end of the brood-nest (not the hive), then looking over the combs from each end of the brood-nest and working toward the center.

My winter cases are used to house my two-frame nuclei. A half of a box is made, having a removable cover and lacking one side, to hold two frames with the necessary bee-spaces but allowing one inch below the frames to give room for any queen-cells that may stick out below the frames. Such a half of a box is nailed on to the inside wall of the winter cases and a half-inch hole bored thru the case wall and a small entrance board nailed on the outside bottom of the hole. Sacks of packing are placed next to the nucleus for protection. When the nuclei are no longer needed the half boxes are removed and the hole in the winter case well closed up for the winter.

With this system there are no colonies to watch and feed daily; no larvæ to transfer; no loose cells to handle; no cells exposed to the weather; no cells to cage; also, all cells are built during a honey flow.

You may call this a lazy man's system if you wish. At this season of the year my time is too valuable to do any unnecessary fussing, the value of which is doubtful. To me this is a valuable short cut in case one has no foul brood but a good strain of bees to begin with, and practices annual requeening with all but the best colonies.

Greenville, Wis. Edw. Hassinger, Jr.

Comments on Hassinger's Method.

[In this article Mr. Hassinger has shown some short cuts in requeening that are well worth considering. The weeding out each season of all but the best queens is in itself a long stride towards successful honey-production, and the plan of utilizing the winter cases and packing in making up mating boxes will appeal to those who realize the importance of keeping the queen-cells warm at hatching time; but I would like to caution beginners that to have 50 per

cent or more of the colonies queenless for a period of three to four weeks would be a heavy drain on the yards, and one which the beekeeper could ill afford in case he has a fall flow in his locality. In Mr. Hassinger's location, we are told, the fall flow only serves as a stimulation; so the loss of bees that would have hatched from eggs that might have been laid during these few weeks, would, in his case, be of little value. In those places where one can count on a fall flow, however, I believe that those colonies that are to furnish the cells for requeening could be made queenless eight days in advance of the others. This would shorten the queenless period 30 per cent for those colonies whose queens were killed on account of their being of an inferior quality. Mr. Hassinger says, however, that if he were to kill the queens in the other colonies and at the same time give them a frame with unprotected cells, 50 per cent of his colonies would destroy all such cells and raise cells from their own brood. His experience does not agree with mine.

In regard to introducing queens to those colonies that did not accept the first queen, I believe that if they were good Italian colonies, and sealed brood were given them, they would be in as good condition for introducing queens before allowing them to build cells as they would after, but with some hybrids this would not be true.

This article brings up the question of using natural cells built under a queenless impulse. It is well known that colonies which have been made queenless, in their haste to improve the time in which queen-cells can be started, often start some of their cells with larvæ two or three days old, this being fully half of the feeding period of the larvæ. Queens reared in this way could not be expected to equal those which have been fed as queens for the entire time. Yet these cells, started from two- or three-day-old larvæ having 30 or 40 hours start of the others, are the first to hatch. And since the first queen out destroys all the others, the queen remaining in the hive is likely to be lacking in quality. Mr. Hassinger thinks such a queen would be just as prolific as one raised from the egg, tho she might not be prolific for as long a time. Now I question not only the prolificness, but also the entire quality of the queen. But, since Mr. Hassinger admits the queen may be deficient in length of prolificness, I feel justified in concluding that her other qualities will be likewise deficient. I think the practice of using natural cells built under a queenless impulse should be discouraged, unless they are built in colonies whose queen-cells have all been destroyed seven or eight days after they were made queenless and the bees thus compelled to start queen-cells on the given frames which contain eggs only or just hatched larvæ.—Mell Pritchard.]

THIS winter when we were making fascinating plans for our western trip I said to the man to whom I confide most of my ambitions, "I am going to write to father (A. I. Root) and see if he can get us permission to visit Luther Burbank's place." I did not expect to meet Mr. Burbank himself, but thought he might permit a man to show us around. Nothing more was said at the time, but in the course of a couple of weeks the aforementioned man brought me a most cordial invitation from Luther Burbank himself who wrote, "Altho my time is priceless beyond any possible expression and we turn off some thousands of people each year who desire to see me, yet if you come I shall make every possible effort to see you." Mr. Puerden had written direct to Mr. Burbank with the above result. It is convenient for a nobody to have a father who numbers great men among his friends and a husband who knows how to obtain what his wife wants.

Mr. Burbank further said in his letter that every growing thing would have to be taken on faith, as they had had the coldest winter he had ever seen in that region since he went to California 43 years ago—that everything was about as dead as in Ohio.

LEAVING San Francisco early in the morning, we reached Santa Rosa, which lies about 60 miles to the north, a little before noon, and after lunching in a little restaurant the head of the family telephoned to the Burbank place. A courteous voice informed him we could see Mr. Burbank a very few minutes, this being his busiest season, and instructed him to call at the residence. We had no difficulty in finding the place, which lies at the edge of the town with a distant background of hills.

We came first to the residence, but not being sure it was the Burbank home went on to an office building on the opposite corner to make inquiries. I remained outside to enjoy the fragrance of a great magnolia tree in full bloom. A little beyond and back of the tree was a greenhouse, and while I stood there a man came around the corner of the greenhouse, carrying a large basket. He was dressed neatly, but no better than any workman would dress for garden work. When the others rejoined me I remarked, "I just saw a man who looked like Luther Burbank's pictures, but I don't suppose it could have been Mr. Burbank."

We then went back to the house where we were received by Mr. Burbank's secretary, the lady of the pleasant telephone voice, and asked to wait in the livingroom where we were presently joined by Mrs. Burbank. Both the secretary and Mrs.

AN HOUR WITH LUTHER BURBANK

Stancy Puerden

Burbank came in with the kindest and pleasantest smile and a cordial handshake for each one. And he was the man I had seen coming around the corner of the greenhouse, carrying the large basket and dressed as an ordinary workman.

I am going to confide to you that every one of A. I. Root's children has remonstrated with him separately and collectively and vigorously over his unconventional way of dressing. We have pointed out to him that his neighbors would not respect him if he went about in such shabby clothing. Now why do you suppose my heart instantly warmed to Mr. Burbank for wearing just the sort of clothes I have so disliked to see my father wear? And some way I am quite sure it would not disturb Mr. Burbank's serenity in the least to have King Albert of Belgium call and find him in just such clothing. Maybe he did.

MR. BURBANK at once led us out of doors and across the street to his experimental grounds. He said, "How I regret that you could not make your visit in June when everything around here is a dream of beauty." He had no monopoly on the regretting. If I am ever in that vicinity in June, I shall slip away to Santa Rosa and prowl around the experimental grounds and peep over the fence and doubtless be tempted to climb it, for I shall never have the nerve to take up any of Mr. Burbank's time again.

He led us past "no admission" signs, by a bed of luxuriant foxgloves which were still dormant for the winter, and stopped by a hybrid black walnut tree growing close to the wall of a storage house. He asked us to guess how old it was. Our sixteen-year old son, 5 ft., 6 in. tall, by putting his arms around the trunk could just touch the tips of his fingers together, at shoulder height, and it was tall in proportion. I believe Mr. Puerden guessed 50 to 100 years. Mr. Burbank said it was just four years old.

Since then I have wondered at my stupidity that I did not ask if it could be grown in a cold climate and whether it will be practicable for ordinary people to try to raise them. I find no mention of walnut trees in Mr. Burbank's 1920 catalogs. Wouldn't it be heavenly if one could plant a few walnuts in his back yard and have a walnut grove in four years' time? It takes such an age for a beautiful tree to grow to maturity, and it is so fatally easy for brainless people to cut it down.

The soil in which the wonderful walnut

Burbank told us that Mr. Burbank was unusually busy and that our time with him would have to be very limited indeed. In a very few minutes Mr.

tree was growing was the hardest clay; indeed, most of the soil on the place seemed similar to the hard clay which reduces one to blisters and desperation in our Ohio garden.

From the walnut tree we went on to a plantation of spineless cacti. They stand up just as stiffly as their desert relatives, but the thorns or spines are absent from the leaves. Mr. Burbank, selecting and peeling some of the fruit, explained that altho green and not at its best he wished us to taste it. The odd-looking fruit looked no more tempting than a cucumber, but to our surprise it was juicy, sweet, and of a flavor reminiscent of muskmelon, and yet, not quite that either. It was rather a delicate combination of fruit flavors. It was delicious. And in addition to the fine flavor it has the quality of being anti-acid, making it a valuable food for those suffering from acidosis. Mr. Burbank cited instances where his friends had used it to correct an acid condition with quick results.

The plant itself is used as a cattle feed. Think of producing 501 tons to the acre. This has been done, and I believe it has proved to be an exceptionally valuable feed

WHEN we went thru the packing rooms, where seed is prepared for mailing, and the office, I noticed Mr. Burbank's manner to his employees and theirs to him. He seemed to have a pleasant word or smile for everyone he passed from a small boy up, and they responded in the same way.

We saw stacks of 1920 catalogs ready for mailing, and received copies of them. While the catalogs are not large and a complete collection of seeds is not offered, as Mr. Burbank points out, no one person can grow all the various seeds which are generally catalogued. He offers the newest and best flowers, fruits, grains, and vegetables, all produced under his personal supervision.

When we went outside again we stood under the branches of a Cedar of Lebanon, the very kind which is mentioned in the Bible. The long, drooping branches, the tips of which swept the ground, made a delightful, shady bower, just the sort of place where small girls like to play with their dolls. Mr. Burbank told us it was always cool under those branches on the hottest midsummer day.

We passed a climbing rose with a trunk like a good-sized tree. We saw a nine-year-old sequoia (giant redwood), which bids fair to crowd the residence if it keeps on growing at the same rate. Behind the house was a woodpile, trimmings from fruit trees, which Mr. Burbank told us might be called a \$100,000.00 woodpile, if one counted the cost of production.

About this time some mention was made of the Burbank potato. Mr. Burbank thereupon told us that if all the Burbank potatoes which were ever grown were loaded in cars it would make a train which would reach around the world.

WHEN Mr. Burbank finally excused himself—mindful of what his secretary had said, we had tried to go once or twice before, but he would not permit it—he insisted that we go back to the living-room and spend some time with his books, curios, and pictures, and said we should come back and shake hands with him before we left.

Certain features of that livingroom, a card receiver, signed photographs of famous men, etc., made me recall the old saying to the effect that if you do something better than anyone else has ever done it the world will wear a path to your door. Santa Rosa must be the converging point for paths from all over the world.

But the point of interest in the room was the 12 volumes, "Luther Burbank—His Methods and Discoveries; Their Practical Application." These are profusely and beautifully illustrated with color photographs, 1,260 large page photographs. Some day I hope to own a set of those books. If I were a young man with my living to make from the soil, I should feel that I could not afford to be without them, altho their price, delivered from Santa Rosa, is \$60.00. I hope every agricultural college and every agricultural experiment station in the country has a set of them. It is a complete history of all that Luther Burbank has learned by 50 years of close work and experiment, told by himself, and it is said to be written in a form so simple that everyone can understand it.

He has also written a little book, "The Training of the Human Plant." This can be obtained from The Century Co. by mail for 65c. Mr. Burbank himself says that all he has ever done has been thru the control and manipulation of those two great forces in life, plant and human, heredity and environment.

Some may wonder why I have not taken more space to tell of Mr. Burbank's wonderful achievements. That was not the purpose of this little sketch at all. I have merely tried to share with my readers some of the pleasure of that hour in Santa Rosa, being careful not to exaggerate or make any mistakes.

After all, the most inspiring part of the experience was meeting the man himself. From what I had heard and read I had gained the impression that Luther Burbank was a recluse, interested in little beyond his plant creations. We found a man young and full of energy in spite of 70 busy years, enthusiastic about his work, with a gentle friendliness and charm which make his visitor feel at ease from the first. Tho it sounds paradoxical I believe it is love for humanity which compels him to deny himself to so many visitors. If he received some thirty a day, the average number who have been coming of late, he could not accomplish the great work which he is doing, work which is of inestimable benefit to the human race.

SEVERAL times it has looked as tho this spring would surely be a Terrible Warning. After some warm bright weather, brood-rearing getting nicely started, peach trees all a glowing pink, pears snowy white and plum petals drifting down the scented sun-lit air, most woeful things have happened; days of cold rainy weather, with frosty nights and danger of chilled brood; danger, too, of some colonies starving—colonies that were just on the ragged last edge of winter stores and beginning to depend on what they could gather; then sun and warmth and bees flying again; then a three-inch rain; more sun and flying bees; then on Easter Sunday a wind coming suddenly, swiftly, piercingly out of the west, and the mercury falling heavily from 74 to 28 degrees. We had no monopoly on that storm—it was widespread. It has been a narrow escape for many bees—and perhaps some didn't escape. Certainly there have been losses this winter and spring at one period or another by starvation. The only colony we lost went by that route in February. The winter itself having been very mild, most of the loss will have been from starvation—or queenlessness.

All our own queens came thru the winter, tho at an early examination I thought for a few minutes that we had one queenless colony. In one cell after another, the tiny eggs were thrown in on one another, in most unquely fashion, looking for all the world as tho they had been carelessly tossed in—some on the bottom of the cells, some on the sides, some on one another, some on unsuspecting little larvæ. "Laying workers," I moaned, yet withdrawing the accusation almost as soon as made, to change it to a question. For in contrast to the scattering here and yon over the comb usually indulged in by laying workers, this brood space was properly compact, and the part that was sealed was flat like any normal worker brood. Even while I puzzled over the matter, right across the comb the queen came walking, as tho to reassure me. "Very well," I told her, "I see you are here. But why do you treat your eggs this way?" The next examination showed nothing unusual. She had corrected her disorderly habits.

There was another colony, however, that surely displayed a failing queen. She was not only a laggard in laying, but the sealed brood lay largely in the humpy, bumpy, lumpy unevenness of worker-cells built up to accommodate drone brood. This queen was at the State Fair last fall for a week, with her nucleus of three-band blue-ribbon Italians—how are the mighty fallen! Probably, tho, that proud, uncomfortable week didn't do her any good.

Beekkeeping as a Side Line

Grace Allen

We wintered almost entirely in story-and-a-half hives, and brood-rearing usually, tho by no means always, begins in the upper story. Several queens

at the time of the first general examination, March 27-29, had only two, three, or four shallow combs of brood. In other colonies the brood ran into four or five combs in each chamber, one colony having reached the proud distinction of eight full-depth combs pretty well filled. That was the colony where, looking first into the shallow, I found nothing but honey, eight of the little combs being still sealed solid. Then down below, the hive was being filled with brood. A fine colony, that, to develop into a surplus-producer, if given ample room—into an early swarmer, if unwatched.

While we were looking thru one colony during that first examination, as Mr. Allen drew out a comb from the opposite side of the hive, my breath suddenly caught. I had had a swift glimpse of many sunken, perforated cells. They were not, however, cells of brood, but of honey. That is, they had contained honey; but now, tho part of the capping, having been merely punctured, still remained in place, the honey had been drained out and the cells were dry and clean inside.

"There was a Boy; ye knew him well, ye Cliffs
And islands of Winander!"

So began Wordsworth a certain narrative. And so I begin—there is a pair; ye know them both, ye sideline-reader-folk of Gleanings. They are—of course—sideline beekkeepers. Until two years ago their bees were all in their own backyard, on their own green grass, under their own peach trees. They read and talked among them and walked and sat among them. There they hung their hammock and set their wicker rocking chairs; there, invariably, they took their summer guests. But because the man worked in an office five and a half days in the week, often they worked among their bees on Saturday afternoons when their neighbors to the west chose to gather on the shady side of their house, close—oh, most unfortunately close, to the open beehives. The results depended upon conditions. But quite too often some nice friendly neighbor would be seen running wildly away, head ducked, arms flapping, and general signs of distress evident. Because they never complained, the sideline pair felt particularly uncomfortable. "We just can't increase much more," the man declared. "Evidently not," was the sighed admission. "Anyway, this isn't such a very good location," he comforted. "It certainly isn't," she agreed. "We might move the

bees," he hazarded. "Not all of them," she protested.

About that time a certain widow, having had a few bees left her which she was not able to look after, said, "Bring your bees out here." There were fruit trees in bloom, locust to come and fields that promised clover. "We wish we had some way to move them," they hinted delicately. "I have an old horse and a small covered wagon," said the widow, "would they help?" "They would be the very thing!" cried the pair at once. For they liked—oh, very much they liked doing things different from what they had ever done before and different from what their friends and neighbors were constantly doing. And in this old horse and gypsy-like wagon they saw a gay shatterer of routine. They were in no hurry—there was no compulsion about moving the bees, so they could take all summer, if they chose. "We'll move them off and on," they decided. So off and on during that wonder spring and its full-throated summer and its rich, ripe autumn, whenever the desire smote them, they moved out a few hives of bees. Because the man was busy all day, they moved them mostly in the evening. So the desire smote them oftenest when the moon promised to shower their way with silver light. Then out from the maple and plum trees they would drive into the gathering dusk, both perched on the seat of the queer little wagon, with four to eight hives tucked snugly in the rear. And out into the country they would jog. Sometimes they talked gaily, sometimes not at all; sometimes they ate sandwiches and little cakes, apples and oranges and fat ripe bananas; and always the man had hidden in some pocket chocolate bars or peanut brittle or chewy caramels. Once they got lost on the country roads leading across from pike to pike, and had finally to pull up so steep and straight a hill that the top seemed quite too much to hope the poor old horse to attain. Once when the night was warm they stopped at a country store for ice-cream cones—indisputable signs of the democratic spirit! (But there was such privacy in the covered wagon and the night!) Once they went in the morning, early, before anyone in their neighborhood was astir. "All in the dew and the dawn we'll go," they had planned rapturously the evening before. It rained that morning instead, but out they drove into it, singing; and it was one of the best of all those hive-laden drives, for it was summertime, and what could be more refreshing in hot summer than a cool slow drive thru a soft morning rain?

Always there was a mad dash at the other end to get started home. The old horse and the gypsy wagon were left out there, where they belonged, and down nearly half a mile of country road the pair swiftly sprinted to catch the very last streetcar going back into town on that line. It was always a breathless affair, and always a success. The last dash was the most exciting

of all, and most ludicrous. The widow had sold her horse; not the wagon. So that last trip was made with a horse from a country stable at the end of the carline. Poor beastie—maybe he hadn't always been so slow! The hives were finally unloaded, the horse unhitched and urged off down the road. He saw no reason to hurry—he didn't know the meaning of the word. But that midnight car, the last car of all—it had to be met. So the man pulled while the woman switched. At last he broke into a trot, and man and beast went rollicking off down the road with the woman trailing behind, fairly reeling with laughter and haste and weariness. She and the streetcar reached the spot at the same critical minute, to find the distracted man storming the stable crying, "Anybody here to take this horse?"

At last these unparalleled delights came to an end, for with the close of the season all the bees they were willing to spare from their own vine and fig tree had been moved. There were forty-odd hives in the new yard. Winter settled upon them; then another spring broke, another summer blossomed, the honey was harvested, autumn dropped quietly down, and lo, the widow said they would have to take the bees away.

This, then, they did in this spring of 1920; not, however, after the long-drawn-out off-and-on-ness of the first moving. There was nothing old-fashioned about this, nothing leisurely, nothing at all of dawn or dewy eve. It was all highly efficient, all modernized and motorized. One March day a tiny cavalcade could have been seen wending its way along the pikes and across the lanes between, two trucks, each piled high with bees and supplies, and the pair following in a Ford car with a miscellaneous assortment of odds and ends. Another truckload of supers and one of winter cases and tables and miscellanies, completed the job promptly and efficiently. Everything moved like clockwork—except when one hive leaked bees as it was being loaded, and one of the darkey drivers disappeared. "Where are you, Shanghai?" called the man, after veiling the other driver. "Heah I is," came the reply. Sure enough, there he was—flat on the ground under the other truck! "Why, Shanghai," protested the man, amused, "you aren't scared, are you?" "Naw suh," the driver grinned good-naturedly, "I aint skeert, but I'se a little skittish!"

* * *

"Remember what David Harum said about dogs?" a witty man asked me lately. "No," I admitted. "He said," the man reminded me, "that a certain number of fleas were good for a dog, they kept him from brooding over being a dog. And don't you suppose," he went on, "that a certain amount of foul brood is good for a beekeeper? It keeps him from brooding over being a beekeeper!" I wonder.



FROM NORTH, EAST, WEST AND SOUTH



In Northern California.—The California Honey Producers' Co-operative Exchange held its second annual meeting in Los Angeles on March 29, thus bringing to a close the first year of its existence. There was a full membership present, and much important business was discussed and enacted. The men chosen as directors for the coming year appear to have given general satisfaction throughout the State. Northern California was represented by Willis Lynch of Salida and W. A. Tricky of Bishop. Mr. Lynch was again elected president of the Exchange, and Chas. C. Orr of Ojai is once more our secretary. There is no gainsaying the fact that our Exchange is not only a going institution, but is also a very potent factor in the United States honey market today. The year 1919 has been the only year in the history of our industry in which the beekeepers of the State have got the better of the speculative honey-buyer. The policy of the board of directors for the coming season is to curtail expenses as much as possible and to market as much honey as possible outside of wholesale channels. It might also be mentioned that the Exchange at the present time does not think it advisable to join a federated organization of honey-producers' associations for the purpose of marketing honey collectively.

California beekeepers, please take notice. Here comes Tarlton Rayment from North Gippsland, Australia, and tells us in the Australasian Beekeeper for February that he once produced from a yard of nearly 200 eight-frame colonies five and one-half cases (660 pounds) of honey per colony, and he adds, "We cannot believe that any other pattern of hive could have excelled the yield." (Mr. Bixby will be pleased to hear that bees in eight-frame hives are still able to hold their own.) Old timers will probably have to go back to the year 1884 in order to recall an average production per colony amounting to 660 pounds, and the writer very much doubts if this record has ever been equaled in California. Mr. Whitacre of Piru, Ventura County, once told the writer that he got an average of 428 pounds per colony from about 150 colonies in 1884. In the San Joaquin Valley there is a case on record of an average of 378 pounds per colony, and in another instance, 800 colonies, spring count and located in several yards, produced an average of 313 pounds per colony. M. C. Richter.

Modesto, Calif.

* * *

In Southern California.—April 4 finds southern California beekeepers who have their bees near the orange groves, at their very busiest. It has taken constant attention to keep colonies from swarming. For some time before the regular flow started, just

enough nectar was brought in to stimulate brood-rearing and encourage the building of swarm cells. To have a colony swarm just at this time very materially impairs its usefulness for some time or until the orange flow is well past. For the past three days the orange flow has been all that one could ask for. Strong colonies with a good supply of bees of a honey-gathering age have filled the supers very rapidly. The nectar is very thin, which is a good sign, and with favorable weather conditions this good flow should continue for several weeks.

Brighter and brighter grow the prospects. Remarkable rains for the time of the year fell during the latter part of February and all thru March. With mild spring weather, we should get good results for our labor. It is to be regretted that so many apiaries are below normal in strength and will be late in being ready for the gathering of surplus honey. The cool nights are the great drawback at present; and the days being not very warm, nectar secretion is not so good as it should be. The black sage has been blooming rather unevenly—in some sections quite abundantly. However, but little honey has been stored from this source. Of course, with plenty of moisture, new shoots will continue to grow and new blossoms continue to appear. But, generally speaking, a plant secretes honey best about the time of full bloom, and the blossoms coming later are not of so much importance. The white sage is making a fine growth, but June is the month when it should be at its best. The purple sage also is looking well, but the results from it will come later on. I may sometime attempt to give the reader a clearer conception of the various sages that help to make a reputation for the California sage honey.

As the season advances, it becomes more and more apparent that the loss from disease, starvation, etc., among bees in southern California is much greater than at first supposed. The loss during the last three years has been stupendous, some county inspectors reporting nearly 40 per cent loss. It is a common thing to have some of the large producers of extracted honey say, "I have to keep buying bees to keep my number good." I find it necessary to make artificial increase to keep the numbers anywhere near normal from year to year. When we have good honey seasons, it is easy to draw a nucleus from a strong colony during swarming time and have it build up to a strong colony in time to store considerable surplus honey. But for several years it has been necessary to supply most of these nuclei with stores, either by giving them combs of honey or by feeding sugar syrup. Either method is expensive at present prices. The California State Beekeepers' Co-operative Exchange met in annual session in Los Angeles on March 29. Two delegates



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from each of the ten local exchanges were present. Reports of business transacted during the first year's work were given and showed that about \$750,000 worth of honey was sold by the Exchange. For one of our short-crop years, this is considered a good showing. A board of seven directors to serve for one year were elected as follows: Gunterman and Culver of Imperial County local, Calahan of San Diego County local, Horne of orange belt local, Trickey of Inyo County local, Lynch of Central Valley local, and Orr of South Coast local. This board will have the selection of a manager and the outlining of a policy for the coming year.

Supply houses report a very heavy demand for supplies of all kinds. There is apparently not so great a demand for one or two colonies as last year, but a much greater demand for small apiaries of from 25 to 100 colonies. Some sales of large apiaries have been made, but most beekeepers who have shown ability enough to accumulate an apiary of from 200 to 300 colonies hesitate to put a price on them. Therefore, very few are for sale at all. One man, whom I know, sold about 50 colonies for \$600.00. The offer was too great to refuse and he could not resist the temptation. When he came to look around for bees to buy, he found that he could not replace his original holdings for the same money.

Corona, Calif.

L. L. Andrews.

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In Iowa.—The increased number of county associations will find their efforts unified thru the State Association. With such effort and support the State Association will be in a position to render more efficient service to the industry. In response to a recent appeal the number of individual beekeepers who have joined the State Association is very gratifying. The Association is for the beekeepers and by the beekeepers and represents their industry. Therefore their united support is needed to accomplish the most for the work.

With the increased interest in county organizations and the State associations it is only natural that the beekeepers of this State will be vitally interested in the American Honey Producers' League. This organization which was perfected at Buffalo in March, as described in these columns last month, has already the hearty endorsement of all of the nine progressive States. Full details of the League will be given to the beekeepers in the near future. The League represents the necessary co-ordinating force for individual State effort. The work of the League is already under way and the results will be of value to every beekeeper in every State.

It is to be hoped that satisfactory results will be obtained from the package bees and nuclei. Several tons of bees were shipped

into this State this year. Hopes were big for results, and there should be no disappointment if the simple directions are followed. As yet, we have practically no exact knowledge on the merits of such bees, but the results which have been obtained by practical beekeepers seem to assure the value of this method of securing bees.

Included in the instruction in apiculture for the present term at the Iowa State College is a course given to girls. In taking the combined course, Home Economics-Agriculture, the girls are fitting themselves to meet better the problems of rural life today. Not all of those who are taking the apiculture are unfamiliar with bees and much interest is taken in the work.

Winter losses are reported to be heavier than was anticipated. This makes a sad story. When will the lesson be learned? Of the average reported annual loss of 12 per cent, as compiled by the United States Department of Agriculture, the beekeeping industry of Iowa suffers each and every year a loss of over \$500,000. If a tax of 12 per cent was imposed on beekeepers, there would be no end to the comment; yet our winter loss comes each year, and now it is almost considered necessary. This spring we heard of very extraordinary losses. In one instance the owner expected to winter in a cellar, and in waiting for a last good flight day the bees were left outdoors all winter. In another instance insufficient protection was given for outdoor wintering which resulted in a loss of almost 50 per cent. To winter bees requires care and an investment. Too many are now trying to winter in poorly constructed cellars, rightfully called "pits." Outdoor packing cases appear to be a very considerable expense, which is to be avoided if at all possible. The facts must be faced and met squarely; the issue cannot be dodged.

Ames, Iowa.

F. B. Paddock.

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In Minnesota.—Pleasant weather prevailed during the latter part of March, and probably most of the bees were removed from their winter quarters in time to get a cleansing flight before the first day of April. On that day the weather changed, and for one week the thermometer registered around 20 to 25 degrees during the daytime, going down to about 10 degrees above each night. During two or three days and nights the wind blew very hard and considerable snow fell. This was the coldest week of April weather that has been known here in many years. At this writing we are not able to tell how much it has added to the winter loss of colonies, but probably, as a result, many weak colonies will not be able to survive.

The Hennepin County Beekeepers' Association held its annual spring "experience meeting" on April 7. Some of the members



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reported very heavy losses, even as large as 50 per cent; while others reported good results, the best record being less than two per cent loss. Why was this difference? The conclusions arrived at were that the main cause of loss was due to poor stores, and next in order was the lack of young bees in the fall, due to little or no fall flow.

The annual meeting of the Southern Minnesota and Western Wisconsin Beekeepers' Association was held at Winona, March 22 and 23. The meetings were well attended, and the discussions were of considerable interest. This is always true of the Winona meetings. Prof. G. C. Matthews of the Bee Culture Division of the University was present and gave a stimulating address on the things necessary for one to become a successful beekeeper. If this plain, practical, and comprehensive talk on the basic principles of beekeeping could be given in the various beekeeping sections of the State, I believe it would do much toward helping beekeepers to get more profit out of their bees. Mr. Matthews not only understands the theory of beekeeping, but he has also had practical experience in managing large apiaries.

The classes in bee culture at the University Farm are larger than ever before, and the interest is increasing. Just now vocational classes, which will continue till Sept. 1, are being started for disabled soldiers. Prof. Francis Jager, chief of the division, has completed his arrangements for rearing leather-colored Italian queens for Minnesota beekeepers. He will begin making deliveries July 1st and all orders will be filled in the order received. For information address the Bee Culture Division, University Farm, St. Paul.

Those interested in the annual State Fair exhibit will be pleased to know that C. B. Stravs has been reappointed as superintendent of the bee culture department. Bear in mind that it is not too early to begin to make plans for your exhibit.

Minneapolis, Minn. Chas. D. Blaker.

* * *

In Ontario.—From reports to date, it appears that the wintering of the bees has been fairly good. Wherever stores were plenty and of good quality, and proper protection given to outdoor-wintered colonies, results have been very satisfactory and the loss small. A number report that natural stores have granulated solid in the combs, and the bees either starved outright or got uneasy, dysentery resulting. In our own case, so far as we have examined our apiaries, our main loss is from the above cause. Some 25 colonies in extra-large hives at one yard were very heavy last fall, and no sugar syrup was fed to them. Very few of these colonies amount to much today altho only three or four are

dead outright at date (April 7). Bees had thoro flights on March 23 and 24, and some cellar-winterers put their bees out on those dates. On April 4 the weather turned cold and stormy and has been that way since; so perhaps bees might be better in the cellar yet.

Clover appears to be in fine condition, and with normal weather from now on prospects are good for a crop of honey.

From what I can learn there is not much old honey on hand in Canada, but what little there is moves very slowly, even if sugar and other commodities that are used in most families are steadily climbing in price. Buckwheat honey is especially weak, altho the crop was light last year.

Much has been said in reference to the new aluminum combs recently placed on the market, and most of the comments have been of a commendatory nature. Thru the courtesy of the manufacturers I had the use of two combs last season, and, while that number is not enough to work with to give accurate data, still I naturally formed an idea as to their future usefulness. The bees accepted the combs all right, and brood-rearing was carried on in a normal way, so far as I could judge. Possibly three-quarters of an inch of space near the end bars is not utilized, as the cells are not perfectly formed there owing to the manner of construction where the metal is attached to the end bars. But I was favorably impressed with their possibilities and so expressed myself more than once—the high price being the one thing against their general adoption. But a recent observation makes me wonder if, after all, metal has not some objections as compared with beeswax, so far as the bees are the judges. These two combs sent us were placed in an 8-frame Langstroth hive, and last fall the colony was fed solid with sugar syrup, seven combs being in the hive. By the way, this colony was on seven combs as near being solid with honey as possible when placed in the cellar about Nov. 20. The bottom-board was fast to the hive, and there was only a small bee-space under the frames. The entrance was only four inches in length and half an inch deep. The colony was purposely left this way to see if bees on solid combs of stores would die if they had no room to cluster under the combs. That such a colony would perish was positively stated by one of our best authorities some time ago, when the question of the so-called "winter nests" was being discussed. Needless to tell my readers that this colony wintered in perfect condition, my son saying it was the best among the 60 when we carried the bees out. I might say that often during the winter a contented cluster as big as an orange was noticed outside of the entrance of the hive.

But to get back to my story. By mere



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chance the combs in the hive were arranged as follows: Four wax combs on the right side of the hive, two aluminum combs next, then one wax comb at the left side, and next a division-board. A few mornings ago when the weather was quite cold, I took a hasty look thru these cellar-wintered bees to see how well they were provided with stores. With the bees all clustered and with narrow top bars in the hives, a glance would, of course, show the sealed honey in the combs. All the colonies, whether weak or strong, had clusters in the usual shape, that is, near the front of the hive and extending across all or some of the combs according to the strength of the colony. But in not a single case did the bees actually reach the back end of the hive, altho a few very strong colonies had clusters across the full width of the hive and came very nearly to the back. The colony with aluminum combs was the last to be examined, and the first glance made me open my eyes wider than usual. This strong colony, instead of having a cluster across the full width of the hive, had the four wax combs on the left side of the hive so crowded with bees that they were tight against the quilt on top and were jammed up tight against the back end of the hive. Some bees of the cluster, if you call it by that name, were touching the first aluminum comb, but not a single bee was between the two aluminum combs nor were any on the wax comb to the extreme right of the hive. I do not wish to make any comment that would be unwarranted, and merely leave my readers to form their own conclusions. If the combs in the hive were all of aluminum construction, then the bees could not discriminate like that. Whether they would be at any disadvantage under those circumstances as compared with being on wax combs, it is not for me to conjecture, for frankly I do not know anything about it. But it appears to be certain that during cold weather bees, by choice, prefer the wax combs to the metal ones. I wish it understood that this is not given in any sense as a "knock" at this new comb, but I always think that a fair and honest expression of opinion is what we all desire.

Markham, Ont. J. L. Byer.

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In Texas.—The weather conditions of the last month have been such that the bees have suffered severely. The warm weather of a month ago started brood-rearing, but the frosts that followed, cut off the nectar flow of the early spring flowers. The latter part of March was so cold and cloudy that all the remaining stores were exhausted. In many sections much feeding has been done. This cold period simply stopped plant growth. Many places report the plants a month late in blooming. Just as the spell came on suddenly, it end-

ed as suddenly. The last week of March brought sunshine, and the bees are again building up nicely. The cold did not seem to hurt the plants, but only to hold them back, and in spite of the Easter blizzard the more noted honey plants give promise of an enormous honey crop.

The Texas Experiment Station thru the Division of Entomology has just issued Bulletin No. 255, "Beekeeping for Beginners." In this bulletin an attempt was made to avoid the objections made to bulletins of similar nature. In reviewing these papers two classes were easily recognized: First, that which contained so little that the beginner got nothing, and second, where so much was given that the beginner was bewildered and did nothing. The present bulletin attempts to give the way to start and one year's program. This bulletin can be obtained upon application to the Experiment Station, Division of Entomology, College Station, Texas.

It is not to be wondered at that J. E. Crane was surprised at the statements relative to the honey exported from Texas as reported by M. C. Richter and myself on pages 92 and 94. Well, it all goes to show that you can prove several things by the same statistics. The 60 per cent which Mr. Richter mentions is 60 per cent of the honey which passes thru the dealers' hands. This amount is only a very small proportion of the total yield, as many counties producing much honey do not ship a single ounce. This honey is sold direct from the beekeeper to the consumer, and there is no way to get the statistics. Of the honey sold on open market, Bulletin 685 of the U. S. Department of Agriculture shows that in 1915, 35 per cent was sold in Texas, in 1916 55 per cent, in 1917 68 per cent. The Bureau of Markets estimates that in 1918 85 per cent was used at home, and three million dollars' worth of honey was purchased from outside sources. Honey produced outside of Texas is a very familiar sight in a Texas store.

It will be remembered that in connection with the Experimental Apiaries a queen yard was established near San Antonio. Queens are now available. The breeding queens now in use are Texas-raised and are picked for their ability to produce the workers that give the greatest yields of honey. Information as to obtaining these queens can be had from the Experiment Station, Division of Entomology, College Station, Texas.

C. S. Rude, with able assistants, is at work on the disease inspection of the State. Queen and combless-package men are receiving the first attention. All intending to ship bees out of the State are warned that their bees will be allowed to enter but few of the States without a permit.

College Station, Texas. H. B. Parks.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Too Many Drones a Detriment.

I have read with much interest what is said in the January number of *Gleanings* in regard to the drone. In 1903, 17 years ago, I published a little booklet in which I said practically the same things. I knew at the time that my words would not then be considered as orthodox by the beekeepers generally, but "all things come to him who waits." I especially call attention to these lines:

"Everyone should know that the greatest expense in raising drones is while they are being fed in the larval state. After they have emerged from the cells it is a loss to destroy them, for they will more than pay for their board in the service they render in keeping up the bee heat in the hive. Their large lubberly bodies are very warm and they keep the brood warm, thus permitting the worker bees to go to the fields. Open a hive in cool weather and see the large congregation of drones (a solid sheet of them) gathered between the outside combs and the hive body. They are there for the purpose of keeping the brood-nest warm. If we have permitted the first cost of having them raised, we should not be guilty of incurring the second cost of killing them."

T. K. Massie.

Hatcher, W. Va.

[From our experience it does not pay the honey-producer to keep an excess of drones even if they are already raised. But far more important than this is the fact that those drones should not be raised in the first place. Not only are such colonies more inclined to swarm, but also such a lot of drones are too expensive in their production and maintenance. It has been estimated that the cost of producing three drones would raise five workers. It is cheaper to raise the workers since they will not only keep the brood warm but nurse it and will also do other work about the hive and later will gather nectar. In a normal colony workers old enough to gather nectar do not stay at home caring for the brood. This duty is performed by the young bees. That very practical beekeeper, Alexander, once said, "The man who now allows his bees to rear thousands of useless drones is but one very short step in advance of the man who keeps his bees in box hives."—Editor.]

Observations on Queens and Swarming.

Bees frequently swarm out at seasonable and unseasonable times, leaving behind scant preparations for another queen and under conditions which baffle the beekeeper for a logical explanation. Altho comments on this have been rife, but little light has been thrown on the mystery.

During the past summer, in an observa-

tory hive, the activity of a queen was noted, whose actions indicated that an explanation of unseasonable swarms may have been found. This queen was restricted for room, and in wandering over the comb looking for new cells in which to lay she frequently neared the entrance of the hive. At such times the bees would be much interested in her, following her about and becoming very active when she came too near the entrance. Then a flutter of the wings would start among the bees nearest to her, who would run about on the combs. The wing fluttering would pass to every bee in the hive, much as grain waves in ripples cross a field in the wind. At such times the queen would also become excited and move rapidly, seemingly returning to the interior of the hive only because of the activity of the bees in her path near the entrance.

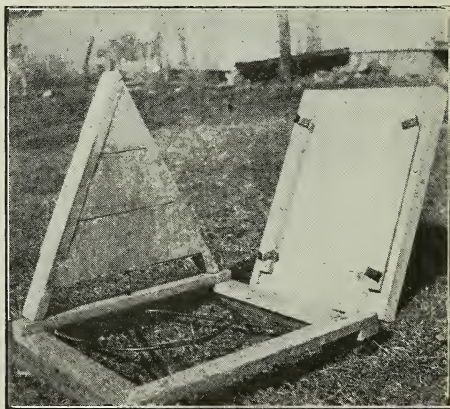
It appears that a queen might frequently lead off a swarm out of season, when she was restricted for room **within the cluster**, even when other room was available. **The queen was never seen to lay outside the cluster.** The anxiety of the bees as the queen neared the entrance was marked. Might she not at such times gain the entrance by mistake and lead off a swarm in the ensuing excitement?

Watertown, Wis.

Kennith Hawkins.

A Good Inexpensive Hive Scale.

When mention was made of a hive scale it brought forth only a smile and sometimes a remark, "Why don't you trap-nest them? or are you going to leg-band each bee?" However, with such encouragement, I could not give up the idea of a hive scale. No other source of information seemed so reliable, helpful, constantly available, and



Showing a bottom-board used as a scale platform, and the frame beneath this from which is hung iron rods connecting with a spring.

HEADS OF GRAIN FROM DIFFERENT FIELDS

easy to secure as from the hive scale. When I tried to buy a scale which would be large enough, its cost, together with the necessary housing, was prohibitive. Moreover,



Mr. Strahan's scale hive, showing scale and its shelter on the left.

it was inconvenient and required too much time to open the house to get the weight; so, "necessity being the mother of invention," I took a bottom-board of a hive, and used it for my scale platform, put a piece of iron with a sharp edge under each corner, made a frame to go under the platform from which I hung iron rods, attached the same as a common wagon scale, and connected it up with a small spring scale in a little A-shaped house at one side, as shown in the picture. Balancing from all four corners, this scale will give the correct weight, no matter on what part of the platform the weight may come, and will weigh anything from one pound up to six hundred pounds. The scale is protected from the weather by a galvanized iron covering, except the glass in front. The scale dial is divided into tenths of pounds instead of into ounces, and, as the platform balance is a ratio of 10 to 1, one pound on the platform registering one mark on the dial, and ten pounds on the platform registering one pound on the dial, it is very easy to read. It sits in a position near the walk where we pass many times during the day; so, with just a glance, we can take note of any slight change. The total cost of the hive scale, including the glass, was \$3.45, other parts being taken from a scrap pile.

The hive scale tells when your honey flow commences, how heavy it is, when it breaks

off, etc. It eliminates guesswork and saves needless manipulations. To me now it is not a question of whether we can afford a hive scale, but whether we can afford to be without it.

C. F. Strahan.

Linwood, Neb.

An Experiment in Transferring.

Several years ago I purchased an apiary containing a considerable number of old-style American hives and supers. There were, in all, about 90 hives and 175 supers, all with good, straight combs built from foundation. For a number of years I used this equipment, as it seemed too valuable to throw away. About a year ago, however, it was decided that we were losing honey by using these hives, and we determined to dispense with them by transferring all colonies to standard ten-frame hives. The work was done just before the opening of the clover flow. The new hives were prepared by using outer combs of sealed honey, kept over from the previous season in order to guard against starvation in case of bad weather, while the middle comb consisted of a frame of brood taken from some other colony, and the remainder of the hive body was filled with empty drawn combs. Beneath the hive body was placed a bee-escape board with tin removed, and above this a queen-excluder. The queen in the old hive was then found, and, after a considerable number of the bees were shaken into the new hive, she was placed on the frame of brood and a cover put on the hive. Next, the old hive was made tight by closing the entrance and all cracks and openings, and the new hive was then set on top. A new entrance was provided by shoving the hive forward about an inch on the escape-board, and the flight of the bees directed to this entrance by leaning a cover board in front. The time re-



Arrangement of new and old hive in Mr. Miller's plan of transferring. Notice cover board placed in front to direct flight of bees to the new entrance above.

HEADS OF GRAIN FROM DIFFERENT FIELDS

quired was from five to ten minutes for each colony.

Now as to results. Frequently it has been stated that, in this mode of transferring, the bees will emerge in three weeks, that all honey will have been removed by the bees, and that no queen-cells will be started in the old hive. As a matter of fact, in this experiment a part of the honey remained, and a considerable number of queen-cells were formed in the lower hives. In some of the colonies the bees succeeded in finding an opening, and, in all such, queen-cells were started; in the others only a part formed queen-cells. At the end of three weeks the old hives were taken away; but, in order to remove the honey remaining in the combs, they were placed in front of the hives at sundown and in the morning were found to be cleaned up.

All things considered, this mode of transferring probably requires less labor than any other, but let us not take it for granted that the bees will not start queen-cells and swarm. The safest way is to look thru every hive and remove all cells within 10 days; for, with the old queen clipped, the young queen will be very apt to squeeze thru the

excluder or otherwise escape with a swarm. If the old queen is not clipped, swarming may occur either with the capping of queen-cells below or about the time the young queen emerges.

E. S. Miller.

Valparaiso, Ind.



Representatives of the Honey Exchanges that met at Salt Lake City, Feb. 20-21 last. From left to right: E. W. Horn, C. E. Dibble, P. S. Farrell, B. F. Hastings, W. B. Parker, and Chas. Orr. See page 201, April Gleanings.



Ma says it beats all how fast her sugar seems to be going ever since we began having the first warm weather this spring.

QUESTIONS.

— (1) Several times I have found what I think are dead bee larvæ on the alighting board of the hive. They are white and have the shape of a bee without wings. Is my brood diseased, or have I killed some brood in examining the hive? Could it possibly be enemy insects? (2) I am cutting out queen-cells to prevent swarming. When the day that I should cut the cells is a rainy day, what is the best thing to do? Is there any danger of a swarm on a rainy day? If not, what happens when the new queen hatches and the weather is rainy? (3) Is it necessary to shake all the bees off from the combs in looking for queen-cells? I can think of no other way to be sure there are no cells, and still this method seems to be a great disturbance to the bees for a weekly program.

Stokely Wilson.

California.

Answers.—(1) Brood is sometimes carried out at the entrance because the colony is short of stores, because the brood becomes chilled, or else from the fact that wax moths have been at work ramifying the combs and injuring the young larvæ. In this case, we rather think the brood was chilled. (2) If the day on which you plan to cut out queen-cells proves to be a rainy day, it is best to put off this work until favorable weather. Should it continue rainy so long that a new queen hatches, there will, of course, be danger that, on the first sunshiny day, a swarm will issue. (3) If queen-cells are removed during pleasant warm weather, so many of the bees will be out of the hives that you will probably have little trouble in finding queen-cells; but, if for any reason, the hive is well crowded with bees, we suggest that you give the frames a slight shake, just enough to dislodge a few of the bees. You will soon accustom yourself to catching sight of the queen when there are quite a number of bees left on the frames. It is really too much of a disturbance to shake all the bees from all of the frames weekly.

Question.—I have 20 stands and some of them have quite a number of drone combs and consequently many drones. I note where someone speaks of cutting off the heads of the hatching drones, but will this prevent drone-rearing when the cells still remain? How can the drone-cells be gotten rid of?

Oklahoma.

Wm. Meyer.

Answer.—You are quite right. Cutting off the heads of the hatching drones is only a temporary expedient and does not do away with the real trouble—excessive drone-cells. It is altogether too wasteful to raise a large number of drones and then kill them. It is far better to cut out the large patches of drone-cells and replace with worker-cells. An excellent time for doing such work is during warm spring days when a little nectar is coming in. After removing the bees from the comb, take a sharp knife and cut out the patches of drone comb. Then using this frame of cut comb as a pattern, place

GLEANED BY ASKING

Iona Fowls

it over the worker comb that is to be used for patches, and with the point of the knife mark out the shape of the holes on the lower worker

comb. Then cut out the marked patches and insert in the holes which they fit. If they do not fit tight, it will be necessary to tie them in with string wrapped around the frame. As this work is done at a time when nectar is coming in, the bees will soon attach such pieces of comb and gnaw away the string.

Question.—Kindly give me your opinion on the situation shown in the cut.

7 Very weak 1918 Q.	8 Fair 1919 Q.	4 Good 1918 Q.	5 Good 1919 Q.
6 Fair 1918 Q.	3 Fair 1919 Q.	1 Weak 1919 Q.	2 Very weak 1919 Q.

The condition of the hives is stated for Mar. 23. The years indicate the age of the queen. Nos. 4 and 5 being strong, I intend to place Nos. 1 and 2 on top of them (Alexander method). I will leave them till May 15 and then replace 1 and 2 on their own stands. After replacing 1 and 2, I intend to place 7 on 4, 8 on 5, 6 on 1, and 3 on 2 and leave till June 15. Is there any chance that these will balance up so as to give reasonable prospects for a crop? I do not wish to lose any more colonies than necessary.

S. Manchester.

Ontario.

Answer.—If those colonies belonged to us, we would consider that we had five colonies, not eight. Colony 1 we would probably unite with 6, killing the queen of 6. Colonies 7 and 2, if really very weak we would probably not even attempt to save, certainly not, if affected with dysentery, for in that case instead of being a help they would be a detriment to whatever colony they were united with. In case we had but few colonies, however, and had them near enough home so that we could give them more attention, we would probably use the Alexander plan of building up, as you intend doing, only we would combine in a somewhat different way. That is, the weak and very weak should be given attention immediately. If any are left as they are from the first of April until May 15, they may be worthless by that time. In one hive body we would place 2 and 7, separating the two by means of a tight-fitting division-board. This body we would place over 5 and colony 1 we would place over colony 4. All of the colonies we would keep supplied with an abundance of stores thruout the spring. Colonies 6, 8, and 3 will soon be strong, and colonies 2 and 7 will build up to such strength that it will be necessary to separate them into different hive bodies, one being left on 4 and the other placed on whichever one of the colonies 6, 8, or 3 seems to be the strongest at that time.

When placing weak or very weak colonies above strong ones it is important that there be brood in the upper hive, and that the work be done without stirring up the bees. If done very carefully, the bees will not even know the change has taken place.

Question.—I would like to know whether brown sugar may be safely fed my bees, or whether cane syrup or corn syrup could be used, or whether we had better buy buckwheat honey from the East, provided it is from a healthy apiary.

Saskatchewan.

John Hubbard.

Answer.—Any of these syrups may be used for feeding in the spring, if they do not contain too large an amount of glucose. If there is too much glucose, the bees are reluctant to accept such feed. The brown sugar would be all right in the spring, as also would be maple sugar or stale candy, such as may often be purchased at a low price. As long as the bees are able to have frequent cleansing flights, such feed will do them no harm. We strongly advise you not to use buckwheat honey purchased from a stranger, unless you are absolutely certain that the apiary from which the honey comes has been free of disease for several years. Otherwise you would be taking chances on foul brood.

Question.—I put one colony in a building close to an opening in the wall and they did finely, but were very cross. They would crawl and fly and when the opportunity offered they would sting. I got more stings from that one colony than from all the other 25 colonies. Did I just happen to get a cross colony or are they proved to be cross in a building? I am thinking of having several colonies inside a building, but if it makes them cross, they will make it pretty warm for me.

Montana.

Hiram Miller.

Answer.—Evidently you happened to choose a particularly cross colony for placing in the building. It is generally claimed that bees in buildings are better-natured when being handled than are those outdoors, for as soon as they leave the hive their main idea is to get outdoors, rather than to sting the beekeeper.

Question.—What should be the proper space under the frames in winter and summer?

Ohio.

Geo. H. Foote.

Answer.—The ordinary bottom-boards are made with a space $\frac{3}{8}$ inch on one side and $\frac{1}{8}$ inch on the other. The original intention was that the bottom-board should be used with the $\frac{7}{8}$ -inch space under the frames during the summer and the $\frac{3}{8}$ -inch space during the winter. It has been found, however, that many of the beekeepers prefer the $\frac{7}{8}$ -inch space thruout the year and so do not turn the bottom-boards.

Question.—I would like to ask how many bees Mr. Thompson puts in his mailing and introducing cages when preparing them for shipping queens? I think 12 is about right for the small Benton cage, but his cage has one more hole for bees than the small Benton cage.

California.

James McKee.

Answer.—On inquiry we find that Mr. Thompson puts from eight to twelve bees in a small three-hole Benton cage, from 17 to 20 in the six-hole long-distance cage, and from 40 to 50 in the large export cage; so

the cage with five holes would require from 12 to 15. In the spring and fall of the year the larger number should be used.

Question.—In Doolittle's book on queen-rearing, he gives an easy way of requeening by putting a frame of brood with a queen-cell in an upper story above a queen-excluder, the excluder being removed as soon as the queen hatches. It appears to me that this would be a very useful method, if it will work successfully. Please advise me.

Illinois.

R. S. Barber.

Answer.—This plan will work under favorable conditions, but we would prefer to wait a day or two after the queen hatches before removing the excluder. The young queen being so much more active than the laying queen usually has little trouble in disposing of her rival. At swarming time, however, there is always a chance that a swarm may issue.

Question.—When in England I noticed all hives are about 12 inches from the ground. Is this advisable here or not?

Virginia.

S. C. Wolcott.

Answer.—In the South where ants and other insects trouble the colonies, it is necessary to have the hives some distance from the ground. In other places it is not necessary to go to the trouble, and when working with colonies that are piled high with supers of honey, there is, of course, less lifting to do if the hives are near the ground.

Question.—I have ten hives of bees and I know very little about the bees and don't care to buy an extractor this year. I think I could get some chunk honey if I knew a little more about it. I would like to know if the frames need to be wired for chunk honey, and if an inch or two for a starter without wiring won't do just as well, and how chunk honey is put up and sold.

Florida.

Samuel M. Turner.

Answer.—The frames need not be wired, nor are full sheets of foundation necessary. Simply starters will be sufficient. The honey is cut from the frames in chunks and placed in glass jars, tin pails, or cans, and the container then filled with liquid honey. It is much easier to produce chunk honey than regular comb honey, since even partly sealed sections may be used for chunk honey.

Question.—A man who was troubled with asthma quite badly told me that he took a little horseradish and honey for his trouble, and it was the only thing for him. This man is an auctioneer, crying sales every day at this time; so he has lots of use for a good voice. I would be very much pleased to know if anyone having asthma would be benefited by this simple remedy.

South Dakota.

F. A. Dahl.

Answer.—As to whether honey and horseradish would offer any relief in case of asthma, we do not know. It is true that we have had a few reports of people with asthma being benefited by the use of honey; but, as you know, there is no remedy offered for any purpose whatsoever that does not apparently help some people. If we were troubled with this malady, however, we would certainly try your suggestion. We might also add that some have found a mixture of honey and cream beneficial.

WE also find that those using 8-frame hives are satisfied with their equipment, either for comb honey or extracted. This is the reason the

writer differed with E. R. Root when he inferred the 8-frame hives were a back number. This is not saying that if these beekeepers had started with 10-frames they would have regretted it, but in order to thresh the idea out, the manufacturers were asked for information and their replies indicate the writer as being correct. One reports orders for 3,000 8-frame hives and none for 10-frame; another reports orders for but 150 10-frame hives for every 1,000 8-frame. As Hans says: 'Dey (the bees) like it better to go oop, dan to go vider,' and there may be something in it. Anyway, the demand for 8-frame hives goes merrily on and, after all, 'tis results that count, and these 8-framers are certainly getting them.'—E. J. Ladd, Multnomah County, Oregon.

"My bees were well covered in snow. Those deepest covered came out best."—L. K. Feick, Cheboygan County, Mich.

"The pert, persistent, pernicious, perverting and pestiferous perennial dandelion has some real backers in the beekeepers of Minnesota. The first honey flow of the 1919 season in Minnesota was furnished by the dandelion, say the beekeepers, and was a life-saver. The flow from the dandelions started in May and was maintained all thru the month. Some good colonies, say apiarists, made a net gain of 25 pounds for a week with a maximum of nine pounds brought in during a single day, practically all of it from the lowly dandelion."—University Farm, St. Paul, Minn.

"Bear in mind that it takes a frame of food to produce a frame of bees. Between now and the clover flow your bees must rear in the neighborhood of 15 frames of brood in order that you may have the kind of colony you want for gathering a bumper crop. It takes a lot of food to do this."—B. F. Kindig of Mich. Agri. College.

"Prof. Jager, chief of the division of bee culture at the Minnesota University, says that the losses over the United States will run from 35 to 50 per cent and are around 40 per cent in Minnesota. Many small apiaries, he says, have been wiped out. Prices per colony have advanced to \$15 and \$20 each."—University Farm Bulletin, St. Paul, Minn., Apr. 8.

"We still have our 1919 crop. Strange, that with consumers paying war prices for honey, there are scores of carloads of honey in the West, for which sale cannot be found, and this in face of the fact that for months at a time, in some States, almost no sugar was obtainable. There will never be the

BEES, MEN AND THINGS

(You may find it here)

largest demand for honey, until it can be put in the hands of the average consumer, in packages cheap and neat, at a minimum advance over the cost of pro-

duction, is the conclusion that we of the West are forced to entertain."—E. F. Atwater, Ada County, Idaho.

"I have just read J. E. Crane's reference to the fertilization of alfalfa by the bees, page 87, February issue of Gleanings. I wish to say that we are located in a section that grows quite an acreage of red clover. Our bees pay very little attention to the first or hay crop, but work on the second or seed crop enough to increase the seed crop from an average of $\frac{3}{4}$ bushel per acre, before our coming here with the bees, to $1\frac{1}{2}$ bushels per acre, as a number of our neighbors will testify. Our neighbors think very kindly of our bees."—J. Ivan Banks, DeKalb County, Tenn.

"Alabama has a great variety of honey plants, of which sweet clover is our most important. I heard a Northern beekeeper say that there were more bees and queens sold from this section of Alabama than any other part of the United States. By this section is meant a strip of country 15 miles wide and 50 miles long, extending from Montgomery to Greenville. Our honey crop may not quite come up with some northern localities but our crops have reached up into the carloads."—P. M. Williams, Lowndes County, Ala.

"I notice that H. V. Schoonover in the January issue just hates the Demuth method of packing and cannot bear to read anything about packing a-tall. Now Mr. Demuth, it looks to us like another of these cases of casting your pearls, and so forth and so on. But there are just lots of periodicals that do not talk packing all the time. Take for instance The Youth's Companion, The Mothers' Magazine, The Ladies' Home Journal, and just lots of them. But if a fellow wants to read a bee journal, he will read about packing more and more all the time, for the era of better beekeeping is at hand, and better beekeeping and winter packing are synonymous. Come again, Mr. Demuth."—Jay Smith, Knox County, Indiana.

"There will be a large loss of bees in this vicinity—lack of fall stores and a very severe winter. Not a warm day between Nov. 25 and March 20 to give them a cleansing flight."—C. H. Taber, Hampden County, Mass.

"I have wintered my bees in the attic over the dining room for the last three winters with perfect success. I set them so they can get out thru small holes thru the weather-boarding."—Dr. L. E. Moore, Lake County, Ind.

LAST month we learned how to open the hive, and took our first hasty glimpse inside. This month we shall make a closer study of the inhabitants and contents of the hive. Following the directions already given, let us approach the hive from the side and carefully open it with as little jarring and as little smoking as possible.

On removing one of the frames and holding it vertically, as recommended in our last talk, we note hundreds of bees moving all about on the combs. Most of them are like those we have often seen in the fields at work on the blossoms. These are undeveloped females and are the honey-gatherers or workers. Here and there on the combs will be noticed thickset clumsy-looking bees somewhat larger than the workers. These are the males or drones. They are unable to sting or to gather honey, their only function being the fertilization of the queen. The one largest and longest bee in the hive is the queen. It is quite likely that among the thousands of bees the beginner may not see her the first few times he opens the hive, but having once observed her, will have less trouble in locating her a second time. Her regal bearing and the immediate retinue of worshipers, facing toward her and caressing her with their antennæ, or occasionally reaching out their tongues and feeding her, make the queen rather conspicuous to the practiced eye. This one bee to whom such deference is shown is the mother bee of the entire colony. As she proceeds over the combs she apparently chooses the cells that best suit her, and then hanging to the cell rim with her feet she inserts her abdomen in the cell and neatly glues to the cell's base a tiny elongated white egg of about the same diameter as a pin. This egg-laying is the life work of the queen.

Appearance of Brood.

Near these cells of eggs will be seen cells containing what appear to be pearl-white grubs. These are larvæ in different stages of development. Also cells will be seen having light to dark-brown and slightly convex cappings made of wax and fibrous material. These cells contain the sealed brood, that is, larvæ that have spun their cocoons and passed into the pupa stage. Whether these cells are drone or worker may be determined by the size of the cells and the character of the cappings, the drone-cells being $\frac{1}{4}$ inch in diameter and the worker-cells $\frac{1}{5}$ inch. The cappings of drone-cells are also more convex than those of worker-

TALKS TO BEGINNERS

By Iona Fowls

cells. That part of the combs in which brood is reared is called the brood-nest, and the entire chamber containing the brood is called the brood-chamber.

In the spring when the queen begins laying, she generally starts the brood-nest near the center of the hive. As the oval of brood increases in size, similar ovals of brood appear on adjacent combs.

Pollen and Its Storage.

Here and there near the brood will be noticed uncapped cells containing a yellow, red, green, or dark-brown substance. This is beebread, a mixture of honey and pollen used especially for feeding young larvæ. The pollen is gathered by the bees from flowers and carried home packed in pellets on the rear legs. Occasionally a bee with a load of pollen may be seen rushing impetuously about the comb, looking for a cell into which to deposit the load. When such a cell is found the bee backs into the cell and holding the rear legs down dexterously brushes off the balls of pollen.

Honey and Attachment Cells.

Around the outsides of the combs are both worker- and drone-cells with white, yellow or bluish-white cappings, somewhat flattened in appearance. These contain honey that has been placed conveniently for feeding the young brood. At the edges of the comb, attaching the combs to the frames, are irregularly shaped cells called attachment cells.



Queen Drone Worker
(Photographed as nearly natural size as possible.)

Life of the Drone.

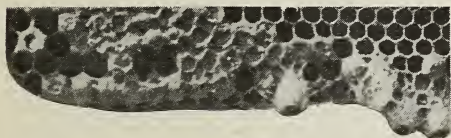
The life histories and the activities of the three kinds of individuals in the hive are very interesting. Moreover, it is quite important that the beginner should have these histories and stages of development well in mind, in order that he may manage his colonies intelligently.

The drone or male bee develops from an unfertilized egg which the queen lays in a drone-cell. In three days the egg hatches into a tiny larva surrounded by a milky partially digested food called "chyle," which is provided by the nurse bees. This larva continues to increase in size until the sixth day from the hatching of the egg; then the larva begins spinning its cocoon and the cell is sealed, that is, a capping of

wax and fiber is placed over the cell. On the 24th or 25th day from the laying of the egg, the drone leaves the cell and about two weeks later takes his first flight. The drones are entirely dependent on the workers for their food; and, whenever stores are short, the drones are driven outside to perish.

Life of the Queen.

Whenever, for any reason such as a deficient queen or a crowded condition in the supers or brood-chamber, a colony feels the need of a new queen, the bees begin the construction of long peanut-shaped queen-



Sealed drone brood at lower left corner; above this sealed worker brood; and at the lower right, three queen-cells in process of construction. When completed the queen-cells will be long and peanut-like in appearance.

cells. As soon as they are nicely started the queen deposits a fertilized egg in each. After three days these eggs hatch into white larvæ, which may be seen floating in a white thick milky substance. The larva, cell, and amount of royal jelly increase until the sixth day from the hatching of the egg, when the cell is sealed. The fifteenth or sixteenth day after the egg was laid, the queen by means of her mandibles cuts a neat circular door at the lower end of her cocoon, and, pushing her way thru, emerges a full-fledged queen. Usually she helps herself to honey soon after leaving her cell and then makes a search for any possible queen or queen-cell that may be present, for all other queens and queen-cells must be destroyed if she is to reign supreme. Altho a queen very rarely uses her sting on a person, she uses it unhesitatingly on a rival queen. From five to ten days after leaving her cell, the queen takes her wedding flight and in a day or two increases considerably in size and assumes a more stately bearing. During the breeding season she may lay 3,000 or more eggs daily and perhaps as many as 200,000 annually for several years. Ordinarily, however, queens are not at their best after the first two years and many beekeepers, therefore, requeen every two years. Those queens that fail to mate properly, lay eggs, but the eggs being unfertilized produce drones only. Such a queen is called a drone-layer, and, unless replaced by a good queen, will soon render the colony worthless, since the workers are gradually dying and no others are coming on to take their places. If one is to succeed with bees, he must keep each colony always supplied with a good laying queen.

The Worker.

The egg that produces the worker is fertilized and is exactly like the egg that produces the queen, but because of different

food and a different-sized cell it results in a worker instead of a queen. The egg hatches in three days, and for the next three days is fed the same kind of food as the queen larvæ, only in smaller amounts. After this the worker larva is fed honey and pollen. In 21 days from the laying of the egg the bee hatches.

The young bee is at first downy in appearance and easily distinguished. The first day or two she walks about eating honey and smoothing down her feathers. After this she acts as nurse bee, partially digesting honey and pollen and feeding it to the young larvæ, and also does other work about the hive such as comb-building, house-cleaning, etc. Her first flight or "play-spell" is taken about the eighth day. This is one of the prettiest of sights, to see the young bees circling about their doorstep in merry flight, getting a view of their home from every angle so that, in their later more distant flights, they may have no difficulty in recognizing their home. In two weeks after leaving the cell, the worker goes to the field for honey and pollen. Sometime when the beginner has the hive open he may perhaps notice some of these young bees returning to the hive with their first load of honey or pollen. What a commotion there is, to be sure! What an eager running about this way and that before the load is deposited! And then out the bee goes for another load. Soon other bees may be seen entering these same cells and carefully packing the pollen. One may perhaps also note workers carrying propolis in their pollen baskets. This propolis is a sticky, gluey substance which the bees gather from buds and use in filling in spaces about the hive.

From Nectar to Honey.

When a bee arrives in the hive with a load of honey, she searches until she finds a cell to her liking and then enters the cell with feet upward. Her mandibles touch the cell where the load is to be deposited. Then the mouth and mandibles open, and a drop of nectar appears. With the mandibles constantly in motion while quite likely some secretion is added to the nectar, the head is moved from side to side and the nectar spread over the upper cell wall. When this honey is first stored it is quite thin, but later the bees evaporate or "ripen" it until it contains less than 25 per cent of water. This work is done mostly at night, the bees standing on the combs with heads upward and then forcing a drop of nectar to the mouth and mandibles where it gently pulsates for about 10 minutes when it is swallowed and another drop appears. This work continues sometimes for nearly half the night. Anyone entering the apiary at this time will note the pleasant odor of the new honey and will also enjoy the drowsy sound of the millions at work ripening the honey.

Wax Production.

While the honey is being ripened and the nectar changed to honey, wax in the form

of a liquid is secreted by eight wax scales on the under side of the abdomen. This liquid soon changes to delicate scales of wax, which after being chewed with secretion become plastic enough to be used in comb-building.

Requeening.

Good results can never be expected from any colony unless it is supplied with a good queen. The most desirable strain is the Italian. They may be distinguished by the three yellow bands on the abdomen. These bees are very gentle, are good honey-gatherers, and are quite resistant to disease. Italians are greatly to be preferred to the cross nervous blacks or to hybrids, which are mostly a cross between Italians and blacks but may be a cross between any two strains. Those possessing a colony of either blacks or hybrids will find it advisable to requeen with a good Italian queen, which may be purchased from any reliable breeder and introduced according to the directions that accompany her, not opening the hive for at least five days after introducing.

Clipping the Queen.

When for any reason a colony becomes dissatisfied with its home—usually because of insufficient ventilation or a crowded condition of brood-chamber or supers—the bees start preparations for swarming. When colonies swarm, two-thirds or three-fourths of the bees, together with the queen, leave for a new home. To prevent swarming, therefore, certain measures should be taken, among which is the clipping of the queen's wings. Having the queen's wings clipped does not prevent the colony from swarming, but it does prevent the bees from leaving for new quarters, because, at the time the swarm issues, the queen, finding herself unable to fly, finally crawls back into the hive, and the swarm, unwilling to leave without her, is compelled to return.

During the middle hours of any warm day when most of the field bees are out gathering nectar, the queen should be found and clipped. She will probably be on one of the central frames of brood and may be readily distinguished by her size and bearing, and also by the bees' attitude toward her as previously described. If picked up by the abdomen, the queen may be injured or killed. She should be carefully picked up by the wings or thorax. With the thumb and forefinger of the left hand hold the queen securely by the thorax, bringing the second finger under her so that she may grasp it with her feet. This gets her legs out of the way so there will be no danger of accidentally cutting one and thus rendering her useless. With a pair of sharp scissors, about one-half or two-thirds of the wings on one or both sides may be cut. The beginner should overcome whatever reluctance he may feel toward clipping the queen, for if these directions are followed she will not be hurt in the slightest.

Preventing Swarming.

If a colony becomes so crowded that queen-cells are started, they should be torn down and more room given, but it is much better to give the room fast enough so that no cells will be started. Those colonies that become crowded for room early in the season, while the nights are yet quite cool, should have a super of empty combs placed under the brood-chamber. This will enable the queen gradually to extend her brood-nest lower, and will leave the brood all in the warmest part of the hive where there will be no danger of chilling.

Two or three weeks before the opening of the main honey flow, when the nights are warmer, those colonies that become crowded for room may be given a super of combs or foundation immediately above the brood-chamber, and two frames of eggs and larvæ from the lower story placed in the upper one, replacing with empty combs or foundation. Of, if preferred, the order of these two stories may be reversed. It is to be hoped that combs will be used; for, if foundation is used when no honey is coming in, it is necessary to feed syrup in order to get the foundation drawn out, and one always objects to feeding syrup too near a honey flow for fear of getting syrup stored with the honey. When some brood is thus kept in the second story the bees become so accustomed to occupying the second story that they store above readily when the flow actually starts. A week or so after the opening of the honey flow, the queen should be placed below and a queen-excluder inserted between the two colonies.

Early swarming can probably be prevented if these directions are followed, and, as a general thing, more honey can be obtained if no increase is made.

If one desires increase, however, he may tear down all capped queen-cells, and insert a queen-excluder between the two stories, leaving the story of brood above and the queen with a little brood below, and then eight days later move the upper story to a new location. The capped cells may be left or, if desired, all but the best may be torn down. The hive should be left with contracted entrance so the brood will not be chilled.

Other Spring Work.

It is a poor plan to remove packing too early in the spring. As long as there is danger of cool weather, the colonies are better off with the added protection.

Weak colonies that are in danger of being robbed or of having their brood chilled, should have contracted entrances; but strong colonies will need a larger entrance, probably a full entrance a few weeks before the honey flow.

As stated in our last talk, there is no more important spring work than seeing that the colonies are continually supplied with plenty of stores right up to the main honey flow. On this one condition the bee-keeper's failure or success often depends.

THE University of Tennessee, in its department of entomology, now offers a full year's course in beekeeping, open to all citizens of Tennessee who may register in the University either as regular or special students. A six-weeks' course is also given in midwinter. G. M. Bentley, State Entomologist, Knoxville, Tenn., is the enthusiastic and able head of the department which is offering such valuable aid to the beekeepers of Tennessee, and he can be addressed for fuller particulars.

JUST NEWS

Editors

Hildreth & Segelken, for many years well-known wax and honey dealers in New York City, recently went into bankruptcy, reporting their liabilities at \$56,000 and their assets at \$21,632.

* * *

In 1914 the total importations by the United Kingdom were approximately 2,600,000 pounds. By 1918 this had increased to 36,500,000 pounds, of which the United States contributed 16,000,000 lbs., valued at \$5,500,000.

WHO'S WHO IN APICULTURE

State	Beekeeping Taught in * Agrl. College	Net Weight Law?	Foul Brood Law?	State Inspector or Deputy	Secretary State Association
Alabama	No	No	No	None	No State Association
Arizona	Yes	Yes	Yes	S. Earl Mattason...St. Davids	Geo. M. Frizzell....Tempe
Arkansas	Yes	No	No	None	Miss Sophie Reed...Little Rock
California	Yes	Yes	Yes	County System	A. B. Shaffner....Los Angeles
Colorado	No	Yes	Yes	Wesley Foster.....Boulder	Wesley Foster.....Boulder
Connecticut	Yes	Yes	Yes	Dr. W. E. Britton, New Haven	L. Wayne Adams....Hartford
Delaware	No	Yes	No	None	No State Association
Florida	Yes	Yes	Yes	C. E. Bartholomew...Orlando	No State Association
Georgia	No	No	No	None	No State Association
Idaho	No	No	No	W. H. Wicks.....Boise	No State Association
Illinois	Yes	No	Yes	A. L. Kildow.....Putnam	G. M. Withrow, Mechanicsburg
Indiana	No	Yes	Yes	F. N. Wallace...Indianapolis	Ross B. Scott....La Grange
Iowa	Yes	Yes	Yes	F. B. Paddock.....Ames	F. B. Paddock.....Ames
Kansas	Yes	Yes	Yes	Dr. J. H. Merrill...Manhattan	O. F. Whitney....Topeka
Kentucky	Yes	No	No	County System	Dr. H. Garman....Lexington
Louisiana	No	No	No	None	E. C. Davis....Baton Rouge
Maine	No	Yes	No	A. M. G. Soule.....Augusta	O. B. Griffin.....Caribou
Maryland	Yes	No	No	None	E. N. Corey....College Park
Massachusetts					P. S. Crichton.....Boston
Michigan	Yes	Yes	Yes	B. F. Kindig...East Lansing	R. H. Kelly....East Lansing
Minnesota	Yes	Yes	Yes	Chas. D. Blaker, Minneapolis	L. V. France.....St. Paul
Mississippi	Yes	No	No	Prof. R. W. Harned, Ag. Col.	No State Association
Missouri	Yes	No	Yes	None	Dr. L. Haseman....Columbia
Montana	No	Yes	No	None	F. E. Clift.....Huntley
Nebraska	Yes	Yes	Yes	County System	O. E. Timm.....Bennington
Nevada					
New Hampshire	Yes	No	No	None	Pres. Littlefield.....Salem
New Jersey	Yes	Yes	Yes	Dr. T. J. Headlee, State Ent.	Elmer G. Carr....New Egypt
New Mexico	No	No	Yes	County System	H. C. Barron....Hagerman
New York	Yes	Yes	Yes	Chas. Stewart....Johnstown	J. H. Cunningham...Syracuse
North Carolina					J. E. Echert.....Raleigh
North Dakota	No	Yes	No		No State Association
Ohio	Yes	Yes	Yes	E. C. Cotton	Jas. S. Hine.....Columbus
Oklahoma	Yes	No	Yes	R. L. Blackwell....Lexington	J. W. Owen.....Chickasha
Oregon	Yes	Yes	No	None	No State Association
Pennsylvania	Yes	Yes	Yes		Chas. N. Green.....Troy
Rhode Island	No	Yes	Yes	Dr. A. E. Stene...State College	No State Association
South Carolina	No	No	No	None	No State Association
South Dakota	Yes	Yes	Yes	L. A. Syverud....Yankton	L. A. Syverud....Yankton
Tennessee	Yes	No	Yes	E. A. Fox.....Fruitdale	G. M. Bentley....Knoxville
Texas	Yes	Yes	Yes	J. M. Buchanan....Franklin	Miss Alma Hasselbauer...
				M. C. TanquarySan Antonio
Utah	No	Yes	Yes	Frank B. Terriberry	No State Association
Vermont	No	Yes	Yes	C. E. Lewis, East...Shoreham	Ernest Larabee....Shoreham
Virginia	No	No	No	None	W. J. Schoene....Blacksburg
Washington	Yes	Yes	Yes	H. A. Scullen.....Pullman	G. W. B. Saxton....Harwood
West Virginia	No	Yes	Yes	Chas. A. Reese....Charleston	Chas. A. Reese....Charleston
Wisconsin	Yes	Yes	Yes	Dr. S. B. Fracker...Madison	H. F. Wilson.....Madison
Wyoming	No	Yes	No	None	No State Association
British Columbia	No	Yes	Yes	W. J. Sheppard.....Nelson	Williams Hugh....Cloverdale
Ontario	Yes	No	Yes	F. Eric Millen....Guelph	F. Eric Millen....Guelph

* Beekeeping taught also in some other colleges and schools in Arkansas, California, Indiana, Tennessee, Texas, and British Columbia.

A FRIEND of Gleanings sends the below which he clipped from the *Kingsley Gospel Tidings*, the editor of which credits it to the *Ivester Glad Tidings*. While I thank the good brother for the information he gives us, I am not quite sure that I entirely agree with him. It has never occurred to me that "gee" had any relation to the word Jesus. I may have used the word to express surprise in times past, but I will try to do so no more.



Let your communication be Yea, yea; Nay, nay: for whatsoever is more than these cometh of evil.—MATT. 5:37.

I pray not that thou shouldst take them out of the world, but that thou shouldst keep them from the evil.—JOHN 17:15.

SWEARING.

The Church of the Brethren stands on Scripture grounds against swearing, but yet there is a sugar-coated swearing that is winked at. Very few people are really free from swearing according to the following: A person used the expression "Gee" not long ago. It had never occurred to that one that this was taking the name of the Lord in vain, and probably few of the many who indulge in sugar-coated profanity realize that they are swearing. What is "Gee" tho but a euphemism for Jesus? "Dear me," is nothing but the Latin "Deo Meo" (My God). "For goodness sake" is only "For God's sake." "For land's sake" is "For Lord's sake." "Drat it" is "God rot it," "Judas Priest" is "Jesus Christ," "Golly," "Gosh," "Gorry," etc., are only corruptions of "God." "Darn it," "Dash it," "Ding it," "Blaine it," etc., are only variations of "Damn it." In short, there is probably not an expression of this sort that cannot be traced back to an oath for its origin. Notwithstanding this you will every day hear people using them thoughtlessly, who would be terribly shocked by an outright oath.—*Ivester Glad Tidings*.

The expression "dear me"! *may* mean "my God"; but I have never taken it so, and I can not think the good friends—yes, and the good women who use the exclamation—have so understood it. The same with the expression "for goodness sake!" The other words mentioned in the clipping, I agree, are undignified. While I used them more or less when I was a boy I have not done so of late years; and I think it is an excellent idea for all of us to heed the words of the dear Lord at the head of this article. A man who tells the truth is not often very vehement about it. I think, as a rule, all the world has more faith in a statement when the speaker does not lose his temper. We might include, in the above, slang expressions of all sorts. Many of them, or, in other words, too many of them, are undignified to say the least. Quite a number of our periodicals have humorous

writers, and I often laugh over their queer spelling and slang; and I am not sure that there is anything wrong about it if it is not carried too far. Many of us remember Josh Billings, Artemus Ward, Alf Burnett, and others. Billings once said, "It is a bad

plan to tell lies, as I know by experience." I had a big laugh over the expression, and it really did me good.

Most of you can doubtless remember other things that have made an impression just because they provoked laughter. As I look back over my life I remember a period when slang phrases seemed to go all over our nation, and after a while these expressions would be forgotten, and yet there would be other slang phrases that seemed to spread like wildfire. Sometimes what might be called a slang phrase or, perhaps, more properly, a little bit of pleasantry, will restore good feeling when there is a jangle that might result in a quarrel. On page 742 of November Gleanings, 1919, I used the expression, "They got the wrong pig by the ear." But that little expression that has been handed down from generation to generation hits the spot better than any other words I could use. By the way, 50 years ago we used to have sermons not only an hour long but sometimes they took two hours, and there was not a bit of pleasantry, and perhaps not a single anecdote, to attract the attention of the children. No wonder they did not like to go to meeting. Nowadays the average pastor recognizes the children, and perhaps some old ones, who might be inclined to go to sleep if they were very tired after a hard week's work; and a little bit of pleasantry on such an occasion, or something to remind the people that the preacher *knew* what was going on in this world of ours—yes, out on the farm, in the factories, and in the stores and groceries—some little incident, and maybe something that some good people might call slang, would catch the children, wake up the sleepy ones, and maybe *drive home* a wholesome moral point. And here comes in my second text:

I pray not that thou shouldst take them out of the world, but that thou shouldst keep them from the evil.—JOHN 17:15.

"PEACE ON EARTH, GOOD WILL TO MEN."

For some time I have been astonished to read about prize fighting in a way that would seem as if it were one of the regular events of the day—perhaps nothing particularly good about it; and it has really seemed as tho some periodicals seemed to think these fights were of no particular harm. There was a prize fight lately in our neighborhood—that is, in the city of Toledo. And, by the way, I believe the Anti-Saloon League has considered Toledo about the wettest spot in Ohio, according to the population; and, as is usual under such circumstances, there was not very much inclination on the part of the authorities to enforce our just laws in regard to intemperance. Well, there was one thing that pleased me about the Toledo prize fight—the *attendance* was a disappointment. By the way, I supposed we had laws forbidding things of that kind; and I supposed, also, there were federal laws. It seems to me that somebody explained it by saying that this was not a real prize fight—it was just a "sparring-match." But even if that is true, one of the combatants was killed not very long ago in the neighboring city of Akron. But I have never been able to learn whether anybody was arrested by law for murder or not. While I was considering the matter, and wondering that our churches and religious periodicals did not make more stir about it, I came across the following in Dr. Bigelow's magazine, *Guide to Nature*. The doctor elips, as you will notice, from another periodical.

IS THIS A CIVILIZED ERA?

Last Monday night, in the Newark, N. J., Armory, a couple of prize fighters, both of whom may perhaps be able to read the English language and write and speak it after a fashion, stood up and mauled each other before 12,000 people, including "statesmen, judges, lawyers, actors, song writers, bankers, business men—in fact, luminaries from the top rung of the social ladder to the bottom," who paid \$58,500 in admission fees to see the fight.

Suppose that, instead of an exhibition of human bulldog savagery, the occasion had been a debate on a subject of the intensest interest, between two of the most eminent educators in the country. Does anybody think the figures of attendance and receipts would bear any comparison to those quoted above? —*Greenwich News and Graphic*

* * * * *

Fifty-eight thousand five hundred dollars, given for one evening's slugging between what is supposed to be two civilized men, is more money than The Agassiz Association has received to carry on its work in the whole 44 years of its existence.

In what kind of a world are we living? and what is it that so appeals in a slugging match more than in the plain common-sense activities in the outdoor world?

I want to put in a big amen to that concluding sentence. Not only America but the whole wide world is just now excited in

regard to the League of Nations that will do away with wars as a means of settling difficulties. What in the world is prize fighting if it is not war? Then the shameful part of it is not only that \$58,500 was paid for admission, but that statesmen, judges, lawyers, etc., according to the *Greenwich News and Graphic*, "from the top rung of the social ladder to the bottom, took part." But I do not quite agree with them. There is no mention of ministers of the gospel, nor even of our college professors, and I hope that none such were present. It occurs to me (but perhaps I am wrong) that the class of people who delight in this "bulldog savagery" are the very ones that would be likely to lead a lynching gang; and if they could not find "the right nigger," as one of the crowd said recently, "Give us *any* nigger." I hope to live long enough to see not only prize fighting but lynching taken in hand by the strong arm of the law. Just a word more:

Horse racing used to be a great pastime, and I am afraid it was a great excuse for gambling; but since automobiles and, later, flying-machines have left the poor horse away in the wake, the whole wide world begins to recognize that electricity and gasoline are to relieve the poor horse, because he is not "anywhere" compared to these other agencies. Well, it is a grand thing to develop human muscle as well as the muscles of animals; but can it not be developed just as well and just as thoroly in making a garden or doing something that will tend to "reduce the high cost of living," instead of beating up some fellow man? May God help us.

POTASH FOR POTATOES.

In my experiments at my Florida home in growing potatoes, I for several years used a fertilizer with a pretty large percentage of potash. When the war opened up and cut off the potash from Germany the potash was largely omitted. In fact, I bought one or two sacks of fertilizer containing no potash. I wrote to Professor Rolfe, of our Florida Experiment Station, and he advised *some* potash, even if it did cost extravagantly. After considering the matter I find the following in the *Florida Grower*:

POTATOES ON FLORIDA SOILS NEED POTASH.

During the past two years B. F. Floyd, plant physiologist to the agricultural experiment station, has been conducting an extensive field experiment with potash fertilizers on a potato plantation near Hastings. The experiment included five acres. The soil was a sandy loam underlain with clay at a depth of about two feet and well drained. The land was new and had never received any fertilizer previous

to the time the experiment was started. Complete fertilizers containing none, 1 per cent, 2 per cent, and 5 per cent potash, respectively, were used. The fertilizer was applied at the rate of 1,700 pounds per acre.

The experiment was begun in the spring of 1918. The average yield per acre for all plats that were given ammonia and phosphoric acid, but no potash, was 12.7 barrels in 1918, and 27.8 barrels in 1919; that for the plats receiving ammonia, phosphoric acid, and potash, irrespective of amount, was 23.4 barrels in 1918 and 43.5 barrels in 1919.

The following table shows the yields in barrels per acre obtained in 1918 and 1919 where the various amounts of potash were used:

	1918	1919
No Potash	12.7	27.8
1 Per Cent Potash.....	20.2	35.5
3 Per Cent Potash.....	24.7	41.6
5 Per Cent Potash.....	25.2	53.5

In 1918 the field was new, the land having been cleared less than a year previous. No crop had been grown on the land previous to the time the potatoes were planted. During the summer of 1919, following the potatoes, a crop of cowpeas was planted on the land. The cowpeas made a uniform growth over the whole field. No difference in growth was noted between the parts where no potash had been used and the parts where potash fertilizers had been applied. The cowpeas were cut and plowed under as a soil improver.

After reading the above I felt still a little uncertainty about it; so I submitted the clipping to Director Thorne, of the Ohio Experiment Station. Below is his reply:

Mr. A. I. Root:—In regard to the use of potash, I enclose a leaflet from a bulletin which is now in press, which will be sent you as soon as completed, and call your attention to the way potash has been behaving on our potatoes. Taking the 12-year period, 1894-1905, you will notice that acid phosphate has given 18 bushels of potatoes in increase and potash only 4 bushels, while during the next period the acid phosphate gave a minus of 2 bushels, while the potash has increased to 26 bushels. You notice further down the middle column that acid phosphate and potash combined gave 21½ bushels during the first period and 46½ bushels during the next, showing that acid phosphate was not without effect, provided it had the help of potash; but that the chief role had shifted during these 25 years from phosphorus to potassium. Turning over this sheet and taking the wheat figures, you will see that acid phosphate has remained consistently in the lead thruout the entire 25 years. It is one of the queer things in our work, but supports the commonly accepted belief that potatoes are peculiarly responsive to potash. You will notice that it took more than 12 years, however, for this condition to manifest itself in this work of ours.

Yours cordially,
CHAS. E. THORNE.

Wooster, O., July 9, 1919.

A REPORT FROM WHERE SUNFLOWER SEED IS GROWN BY THE THOUSANDS OF TONS.

SEE PAGE 612, SEPTEMBER ISSUE.

Dear Mr. Root:—I am sorry, but I am afraid I am not able to give you the information you wish, and I don't know of any one who can give it. I keep about as many colonies of bees as any one person in this locality, and attend to my bees as well as any one. We know that the honey from sunflowers is light yellow in color and in quality is good, but the amount from that source alone I can not tell. There are many other sources now, as this region raises considerable alfalfa (sweet clover

has quite a start) and all kinds of melons; in fact a little of everything in the garden line. So the honey is mixed. I extracted some while sunflowers were at their best, and got the nearest pure sunflower honey that we have secured for several years. More sunflowers were raised this year than for several years before, and as they bring a good price, more will likely be raised next year. They are surely a good honey plant, as bees are at work on them all the time they are in bloom. On ditch banks and similar places there are lots of wild sunflowers which bloom until killed by frost. While cultivated sunflowers were in bloom, I noticed there were very few bees working on the wild varieties, but now there are many working on the wild. This is just the time for harvesting the sunflowers. The buyers are offering for seed 7 and 7½ cents a pound.

ERNEST E. WARREN.

Manteca, Calif., Sept. 7, 1919.

The new sunflower referred to on page 612, September Gleanings, which was originated by Burbank, is now growing in our garden. We have about 50 plants. While the greater part of them are only three or four feet high, and have only one large blossom, there are perhaps five per cent of the plants that run up tall and send out side branches with small heads. From this we judge the type is not yet fixed.

The bees are hovering over the blossoms more or less all day long. I do not know how much honey they get; but most of them carry away good-sized loads of pollen. There is also a sticky substance, not only on the blossoms but on the leaves near the stem. The bees work on this, even before any bloom appears. Some of the leaves are 18 inches across, and as long as that from the stem to tip.

Later.—Since the above was written we have received the following from friend Warren:

Dear Mr. Root:—I sent you a sample of as near the pure sunflower honey as I could, as I said in my other letter. It is almost impossible to get it pure now, as so many other flowers are in bloom at the same time. The honey I sent you was only to give you a better idea of the sunflower honey than I could tell you. Please accept it with my compliments. We have a good market for all we can produce. A few colonies produced a little over 100 pounds each of that kind of honey, but most of them about 50 pounds. Our fall honey is quite dark. I keep only about 70 colonies.

ERNEST E. WARREN.

Manteca, Calif., Sept. 23, 1919.

STILL LATER: SUNFLOWERS FOR RABBITS AND SUNFLOWERS FOR "H. C. L."

Kind Friend:—I have just met one of your "happy surprises." Last evening I was getting out some sunflower seed, and after I had gotten the seed out I sliced one of the heads for my rabbits, and it looked so good that I had my wife fry some of it for breakfast this morning. It was fully as good as eggplant or mushrooms; and was the best substitute for meat I have ever found. I ate quite freely of it and have experienced no ill effects from it yet. Maybe you know if it has been used for human food and if it is perfectly wholesome.

A. L. BEALS.

Rt. 3, Cicero, Ind., Oct. 5, 1919.

Classified Advertisements

Notices will be inserted in these classified columns for 30 cents per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISERS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued while they are in good standing.)

Theodore N. Ross, Wilmer Clarke, Edw. A. Winkler, Chas. Sharp, Custer Battlefield Apiaries, E. B. Rosa, A. M. Moore, A. Stanley & E. C. Bird, A. W. Smith, Allenville Apiaries, S. T. Crawford, B. F. Averill, D. T. Gaster, J. F. Michael, St. Vincent Collie Kennels, F. Rasmussen, C. N. Flansburgh & Son, Leahy Mfg. Co., Leonard-Morton & Co., W. N. Scarff & Son, L. W. Crovatt, R. H. Shumway, Holden Mfg. Co., W. H. Laws, F. J. Severin, Electric Wheel Co., Elias Fox, F. M. Baldwin.

HONEY AND WAX FOR SALE

Beeswax bought and sold. Strohmeyer & Arpe Co., 139 Franklin St., New York.

FOR SALE.—Clover extracted honey in 5-lb. pails. L. S. Griggs, 711 Avon St., Flint, Mich.

FOR SALE.—Clover and buckwheat honey in any style containers (glass or tin). Let us quote you. The Deroy Taylor Co., Newark, N. Y.

FOR SALE.—Four tons choice clover honey, extra well ripened, packed in new 60-lb. tins, two in a case. Wish to sell in one lot. Lee & Wallin, Brooksville, Ky.

FOR SALE.—12,000 lbs. new crop, well-ripened Old Ky. No. 1 clover honey, in 60-lb. cans, at 22½¢ per lb. f. o. b. Brooksville. Sample 25c. W. B. Wallin, Brooksville, Ky.

FOR SALE.—We have a very choice lot of white clover honey at 25¢ per lb. in 60-lb. cans; also some very choice fall honey at same price. M. V. Facey, Preston, Minn.

FOR SALE.—We have a small part of our crop of white clover-basswood extracted honey left, packed in new 60-lb. cans, two to the case. Write for prices. D. E. Townsend, Northstar, Mich.

FOR SALE.—24 cases buckwheat comb honey No. 1 quality, \$6.00 per case; 12 cases mixed, not all capped, \$4.00 per case, six cases to carrier; clear clover extracted, 25¢ per pound. Buckwheat and clover mixed, 20¢; two 60-lb. cans to case. H. G. Quirin, Bellevue, Ohio.

E. D. Townsend & Sons, Northstar, Michigan, offer their 1919 crop of white clover and white clover and basswood blend of extracted honey for sale. This crop (it's only a half crop this year) was stored in nice white clean extracting combs that had NEVER had a particle of brood hatched from them. We had more of those extracting combs than we could possibly use this year, and we piled them on the swarms as needed. NOT A SINGLE OUNCE OF HONEY WAS EXTRACTED UNTIL SOME TIME AFTER THE CLOSE OF THE WHITE HONEY FLOW; consequently NONE could be produced that will excel this crop of honey. Of course, it is put up in NEW 60-pound net tin cans, and they are cased up for shipment, two in a case. If you are one of those who buy "just ordinary" honey, at the lowest price possible, kindly do not write us about this lot of honey, but if you

can and have customers who will want the very best and are willing to pay the price, order a small shipment of this fine honey as a sample, then you will know just what our honey is and whether it is worth the little extra price we ask for it or not. We quote you this fine honey, either clear clover, or that containing about 5 per cent of basswood—just enough basswood to give it that exquisite flavor relished by so many—one can, \$15.50; case of two cans, \$30.00. If a larger quantity is needed, state how much you will need and we will quote you a special low price. Kindly address, with remittance, E. D. Townsend & Sons, Northstar, Mich.

HONEY AND WAX WANTED

WANTED.—Small lots of off-grade honey for baking purposes.

C. W. Finch, 1451 Ogden Ave., Chicago, Ill.

BEESWAX WANTED.—For manufacture into SUPERIOR FOUNDATION. (Weed Process.) Superior Honey Co., Ogden, Utah.

WANTED.—Bulk comb, section, and extracted honey. Write us what you have and your price. J. E. Harris, Morristown, Tenn.

WANTED.—Extracted and comb honey. Carload or less quantities. Send particulars by mail and samples of extracted.

Hoffman & Hauck, Inc., Woodhaven, N. Y.

BEESWAX WANTED.—We are paying higher prices than usual for beeswax. Drop us a line and get our prices, either delivered at our station or your station as you choose. State how much you have and quality. Dadant & Sons, Hamilton, Illinois.

WANTED.—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address so we can identify it immediately upon arrival, and make prompt remittance.

The A. I. Root Co., Medina, Ohio.

FOR SALE

I manufacture Modern Cypress beehives. Write for prices. J. Tom White, Dublin, Ga.

HONEY LABELS.—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE.—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

FOR SALE.—3,000 4¼ x 4¼ x 1½ Root sections. At a bargain. A. C. Ames, Weston, Ohio.

FOR SALE.—SUPERIOR FOUNDATION, "Best by Test." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

FOR SALE.—Illinois, Indiana, and Kentucky Beekeepers. Root's Goods at Root's prices. Gronemeier Bros., Mt. Vernon, Ind.

PORTER BEE ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies.

R. & E. C. Porter, Lewistown, Ills.

FOR SALE.—200 8-frame hives with newly drawn combs, wired, \$2.75 each. Write Fred Alger, Waukau, Wisc.

FOR SALE.—Comb foundation at prices lower than you had thought possible. Wax worked for cash or on shares. Satisfaction guaranteed. E. S. Robinson, Mayville, N. Y.

FOR SALE.—New and used beehives and supers. (Italian bees.) Farm of 145 acres, very productive. Fine location and fine buildings. Fruit orchard and sugar bush. Ralph Hibbard, Calcium, N. Y.

We can save you money on Cypress hives, frames, etc. Write for prices.

Sarasota Bee Co., Sarasota, Fla.

How many queens have you lost introducing? Try "The Safe Way," push-in-comb introducing cage, 50c. Postpaid. O. S. Rexford, Winsted, Conn.

FOR SALE.—Five $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{8}$ 10-frame supers, complete, \$8.00.

Wilford Crumrine, R. D. No. 7, Wabash, Ind.

FOR SALE.—125 honey cans, used once, 2 in case, per case, 50c. Leach's Bee Farm, Milwaukee, Wis., Sta. D, R. D. No. 2, Box No. 540.

FOR SALE.—Super foundation mill, entirely new. Money back if not as represented.

Wilbert Harnack, McGregor, Iowa.

FOR SALE.—150 section shipping cases nailed up with glass front holding 20 4×5 plain sections, 15c each. The Hyde Bee Co., Floresville, Texas.

FOR SALE.—Ten-frame standard dovetailed hives in lots of from one to fifty. Very cheap. Write for prices. Wm. Craig, Aitkin, Minn.

FOR SALE.—Hives complete, 1st class, new and almost new, accessories.

Stroh, 5521 Ridge Ave., Philadelphia, Pa.

FOR SALE.—Second-hand hives, 8-frame, in good condition, mostly California Redwood. Write for prices. R. B. Williams, Ingleside, Texas.

ROOT'S BEE SUPPLIES.—For the Central Southwest Beekeeper. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

FOR SALE.—150 cases (2 in case) second-hand 5-gallon honey cans at 50c per case f. o. b. Milwaukee. Laabs Brothers Co., 20th & Walnut Sts., Milwaukee, Wis.

FOR SALE.—Second-hand honey tins, two per case, in exceptionally fine condition at 50c per case. Buy them now for next summer's honey crop.

Hoffman & Hauck, Inc., Woodhaven, N. Y.

FOR SALE.—About 4,000 each, fence separators and holders (4×5). Used a few years, but in good condition, \$1.50 per 100.

J. D. Hull & Bro., Honesdale, R. D. No. 1, Pa.

FLORIDA BEEKEEPERS.—You save money by placing your order for Root's Bee Supplies with us. We carry the complete line. Will buy your beeswax. Write for catalog.

Crenshaw Bros. Seed Co., Tampa, Fla.

FOR SALE.—One 8-frame Root's automatic power honey-extractor; one honey pump, one gasoline engine. I will sell all together, or any one separately. Write for price.

Elmer Hutchinson, Lake City, Mich.

FOR SALE.—One Barnes No. 4 saw; one No. 5 Oliver typewriter; a two-frame extractor; and an Excelsior twin motorcycle. All in good condition, cheap for quick sale.

Warren Miller, Manlius, N. Y.

FOR SALE.—Four six-frame Root automatic hand extractors for Langstroth frame. All in perfect condition. Reason for selling—am using eight-frame power extractor.

C. J. Baldridge, Homestead Farm, Kendaia, N. Y.

FOR SALE.—49 twin-mating nuclei hives with frames $5\frac{1}{2} \times 8$ inches, in good condition. Price, \$1.00 each or \$45.00 for lot. 160 shallow division-boards, nailed, new, 5c each.

Wayne Shilling, Lebanon, R. D. No. 3, Pa.

CANADIAN BEE SUPPLY & HONEY CO., Ltd.—73 Jarvis St., Toronto, Ont. (Note new address.) We have made-in-Canada goods; also can supply Root's goods on order. Extractors and engines; GLEANINGS and all kinds of bee literature. Get the best. Catalog free.

FOR SALE.—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case f. o. b. Cincinnati. Terms, cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, O.

FOR SALE.—First 23 volumes of Gleanings. First 17 volumes bound in black cloth with gilt lettered backs. What offers? Best cash offer gets them.

Geo. Cork, 24 Woolfrey Ave., Toronto, Ont., Can.

FOR SALE.—Good second-hand double-deck comb-honey shipping cases for $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{8}$ sections, 25c per case, f. o. b. Cincinnati. Terms, cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE.—New Novice extractor, \$22; 2 Cowan extractors, \$31.00 each. Italian queens, untested, \$1.50. A safe plan for making increase, 20 cents in stamps. Bargains in supplies.

R. Kramske, 1104a Victor St., St. Louis, Mo.

FOR SALE.—Root's Extractors and Smokers, Dadant's Foundation, and a full line of Lewis' Bee-ware. Our new price list will interest you. We pay 38c in cash and 40c in trade for clean yellow beeswax delivered in Denver. The Colorado Honey Producers' Association, 1424 Market St., Denver, Colo.

FOR SALE.—200 new 10-frame cross style reversible bottom-boards at 50c each; 200 new 10-frame flat reversible covers made of best select white pine at 60c each; 100 new Alexander feeders for 8- or 10-frame hives at 20c each; 150 Boardman feeders without cap or jar at 12c each. All above goods are factory-made and have never been used. Write M. E. Eggers, Eau Claire, Wisc.

FOR SALE.—At right prices, Root Jumbo, 10-frame, dovetailed hive bodies, $16\frac{1}{4}$ inches wide, with metal-spaced frames. Everything nailed and painted, 3 coats of white. Work done by expert mechanics. This lot of 300 bodies has never been out of our warehouse. Dadant medium brood foundation for Jumbo and L. frames, but offered only when brood-chambers are ordered. We can make verified statement, naming several apiary inspectors, that no disease has ever been found in our yards or in this section. Send for complete list and prices. We also offer all kinds of Root 8- and 10-frame supplies slightly used. Orders carefully packed and prompt shipments made. Here are the best of supplies ready to go into the apiaries at money-saving prices.

The Hofmann Apiaries, Janesville, Minn.

REAL ESTATE

FOR SALE.—25 acres 2 miles from Waverly, Va., or trade for 2 to 5 acres, as I don't need so much land.

C. B. Peterson, 6959 Union Ave., Chicago, Ills.

FOR SALE OR RENT.—One of the best honey locations in Wisconsin, 5 acres splendid soil, good buildings, nice shade. Terms, if desired; also 65 colonies bees, 3,000 drawn combs and other large equipment. No disease in Rusk Co.

E. R. Wilson, Glen Flora, Wisc.

AUTOMOBILE REPAIRS

AUTOMOBILE owners should subscribe for the AUTOMOBILE DEALER and REPAIRER; 150-page illustrated monthly devoted exclusively to the care and repair of the car. The only magazine in the world devoted to the practical side of motoring. The "Trouble Department" contains five pages of numbered questions each month from car owners and repairmen which are answered by experts on gasoline-engine repairs. \$1.50 per year. 15 cents per copy. Postals not answered. Charles D. Sherman, 107 Highland Court, Hartford, Conn.

WANTS AND EXCHANGE

WANTED.—10 to 50 colonies of bees. Write particulars to Ross B. Scott, LaGrange, Ind.

WANTED.—To sell or trade 300 8-frame hive shipping screens. F. W. Morgan, DeLand, Ills.

WANTED.—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED.—To buy 300 colonies of bees, equipped for extracted-honey production. L. S. Griggs, 711 Avon St., Flint, Mich.

WANTED.—First-class Stradivarius violin, of foreign make. No maplewood wanted. Must be in condition. Henry Asam, Carleton, Mich.

WANTED.—Bees with queen in 2-lb. packages, for Beseler double-dissolving stereopticon, complete, in perfect condition. Value, \$100. Make best offer. C. T. Mantz, Barryville, N. Y.

WANTED.—3 cars of good mixed hay that shall grade good No. 2. Will take a mixed car of straw oats or corn. Bags furnished if needed. Thomas J. McDermott, Belleville, N. J.

WANTED.—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut St., Cincinnati, O.

OLD COMBS WANTED.—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings or slumgum. Send for our terms and our new 1920 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

BEES AND QUEENS

Finest Italian queens. Send for booklet and price list. Jay Smith, R. D. No. 3, Vincennes, Ind.

QUEENS ON APPROVAL.—Bees by package or colony. A. M. Applegate, Reynoldsville, Pa.

Golden Italian queens, untested, \$1.25 each; dozen, 12.00. E. A. Simmons, Greenville, Ala.

FOR SALE.—1920 Golden Italian queens, price list free. Write E. E. Lawrence, Doniphan, Mo.

THAGARD'S Italian queens, circular free, see larger ad elsewhere. V. R. Thagard, Greenville, Ala.

QUEENS ON APPROVAL.—Bees by package or colony. Birdie M. Hartle, Reynoldsville, Pa.

PHELPS' GOLDEN QUEENS will please you. Mated, \$2.00. Try one and you will be convinced. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE.—Bright Italian queens, \$1.50 each; \$14.00 per doz. Ready after April 15. T. J. Talley, Greenville, R. D. No. 4, Ala.

FOR SALE.—Italian queens, mailed as soon as hatched. Safe arrival guaranteed. June 1, one, 75c; 10, \$6.00. Evan Jones, Franklinville, N. J.

When it's GOLDEN it's Phelps'. Try one and be convinced. Virgins, \$1.00; mated, \$2.00. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE.—Golden queens. Will begin filling orders May 15 in rotation. Untested, \$1.10; selected untested, \$1.50 each. Safe arrival. Hazel V. Bonkemeyer, Randleman, N. C.

FOR SALE.—1920 prices for "She suits me" queens. Untested Italian queens, from May 15 to June 15, \$1.50 each. After June 15, \$1.30 each; \$12.50 for 10; \$11.00 each when 25 or more are ordered. Allen Latham, Norwichtown, Conn.

FOR SALE.—Italian Bees and Queens (the kind that fill from 2 to 4 supers) full colonies, \$12.00 and \$15.00 each. Queens, after May 1, \$2.00 each, 6 for \$11.00. Miss Lulu Goodwin, Mankato, Minn.

FOR SALE.—QUEENS. Italian queens of excellent stock will be ready to mail June 1. Untested, \$1.50 each; 6, \$7.50; 12, \$14.00. J. D. Harrah, R. D. No. 1, Freewater, Oregon.

FOR SALE.—Leather-colored Italian queens, tested, until June 1, \$2.50; after, \$2.00. Untested \$1.25; 12, \$13.00. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

FOR SALE.—Golden and three-banded queens untested, April, May, and June delivery, \$1.25 each; \$12.50 per doz. Satisfaction. R. O. Cox, Greenville, R. D. No. 4, Ala.

FOR SALE.—Queens, nuclei, packages, colonies from our apiaries in Arkansas and Louisiana. Write for prices now. The Foster Honey & Merc. Co., Boulder, Colo.

Golden queens ready April 15th. One queen, \$1.50; 6, \$7.50; 12, \$14.00; 100, \$100.00. Virgins, 75c each. W. W. Talley, Greenville, R. D. No. 4, Ala.

BEES BY THE POUND.—Also QUEENS. Booking orders now. FREE circulars give details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

FOR SALE.—We have all package orders we can handle this season, but can still book orders for queens. J. A. Jones & Son, R. D. No. 1, Box 11a, Montgomery, Ala.

FOR SALE.—My famous three-band Italian queens, one for \$1.25, six for \$7.00. From June 1 to November. J. W. Romberger, 3113 Locust St., St. Joseph, Mo.

FOR SALE.—Leather-colored Italian queens from Dr. Miller's breeder. Virgins, \$1.00; tested, \$1.50. July 1, 5, \$6.00; 10, \$11.00. F. R. Davis, Stanfordville, Dutchess Co., N. Y.

Bees by the pound a specialty; 2000 lbs. for May delivery, 1920; 200 Italian queens for sale with above bees. Write for prices. A. O. Jones & H. Stevenson, Akers, La.

GOLDENS THAT ARE TRUE TO NAME. 1 select untested queen, \$1.50; 6, \$7.50; 12, \$13.50; 50, \$55.00; 100, \$100.00. Garden City Apiaries, San Jose, Calif.

FOR SALE.—3-lb. packages of good and vigorous hybrid bees, \$4.00. Hybrid queens, 75c extra. Shipments from May 20 to June 10. No disease near here. L. L. Ferebee, Ridgeland, S. C.

FOR SALE.—Hardy Northern-bred Italian queens, untested, \$2.00 each; 6 for \$11.00; select tested, limited number. \$3.00 each after June 1. Dr. C. E. Sheldon, Coeur d'Alene, Idaho.

NUCLEI.—Two-frame, without queen, \$4.00; with untested queen, \$5.50. The bees may or may not be pure, the queen will be. Delivery in May. Dr. E. P. Stiles, Austin, Texas.

FOR SALE.—30 colonies bees in 10-frame hives, spaced 9 frames to the hive. Shipment to be made about June 1, when they will be taken out of their winter cases. Price, \$15.00. F. J. Rettig, Wabash, Ind.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL and GEN-TLE. Virgins, \$1.00; mated, \$2.00. C. W. Phelps & Son, Binghamton, N. Y.

Italian queens, the kind that are sure to please you. Untested, in April, \$1.25 each; one untested, May 1 to July 1, \$1.00; one tested, May 1 to July 1, \$1.50. Discount on large orders. Safe arrival guaranteed. L. R. Dockery, Carrizo Springs, Texas.

A. I. Root strain of resisting and honey-gathering leather-colored Italian queens that a trial will convince. Untested, \$1.50 each; 25 or more, \$1.40; tested, \$2.50 each; 25 or more, \$2.25; select tested, \$.300. A. J. Pinard, Morgan Hill, Calif.

DAY-OLD QUEENS at practical prices. Superior improved Italian stock. Mailed in safety introducing cages. Safe arrival guaranteed to any part of the U. S. and Canada. Send for circular. Prices, 1, 75c; 10, \$.60; 100, \$.60.00. James McKee, Riverside, Calif.

FOR SALE.—Bees, good hybrid stock from out-yards in 2-lb. packages, with a tested Italian queen, from home yard at \$7.00 per package; with three-banded untested queens, \$.60. Two-frame nucleus, Italian bees, \$.50; 3-frame, \$.675. C. H. Cobb, Belleville, Ark.

FOR SALE.—Mr. Beeman, head your colonies of bees with the best Italian stock raised in the South. One queen, \$1.25; 12 queens, \$14.00. One pound of bees with queen, postpaid, \$.60. Safe arrival and satisfaction guaranteed.

M. Bates, Greenville, R. D. No. 4, Ala.

BUSINESS-FIRST QUEENS.—Untested, \$1.00 each; \$1.10 per doz.; select untested, \$1.50 each; \$12.00 per doz.; tested, \$2.00 each; select tested, \$2.50 each; breeding queens, \$.50 and \$1.00 each. Safe arrival guaranteed in the United States. M. F. Perry, Bradentown, Fla.

FOR SALE.—Italian queens, three-banded and Goldens. High grade, carefully bred from best select stock. Price each, \$1.25; 6, \$.65; 12, \$13.00; extra select, \$2.00. Orders booked now. Satisfaction guaranteed. G. H. Merrill, Pickens, S. C., (Formerly Liberty.)

FOR SALE.—60 colonies of bees in one-story ten-frame hives, wired frames, full sheets of foundation. Young queens, strong and free from disease. This lot of bees is above the average, and I offer the entire lot for \$900 f. o. b. Washington, Indiana. No order for less than the entire lot considered. S. H. Burton, Washington, Ind.

ITALIAN QUEENS.—Three-banded, select, untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect markings. Price, \$1.25 each; 12 or more, \$1.00 each. Send for circular. J. H. Haughey, Berrien Springs, Mich.

MOTT'S NORTHERN BRED ITALIAN QUEENS.—I have breeding mothers placed in the South for April and early May queens. Plans "How to Introduce Queens and Increase," 25c. If you want beauty with the best of summer and winter laying birds, try a setting of my Golden Campines. E. E. Mott, Glenwood, Mich.

We have enlarged our queen yard considerably. We can take care of orders better than ever, large or small. April 15 to June 1, untested queens, \$1.25; tested, \$2.50; untested, \$1.15; 100 per 100. After June 1, \$1.00 each or \$90.00 per 100. J. A. Jones & Son, Montgomery, R. D. No. 1, Box 11a, Ala.

QUEENS.—Select three-banded Italians. Reared from the best mothers and mated to choice drones. Ready to ship May 1. Untested, one, \$.20; six, \$.90; twelve, \$1.60. After June 1, \$1.50; six, \$.80; twelve, \$1.40. Select tested, \$.30 each. Write for prices per hundred. Descriptive circular free. Hardin S. Foster, Dept. G, Columbia, Tenn.

FOR SALE.—Highest Grade Three-banded Italian queens, ready June 1. Queen and drone mothers are selected from stock of proven worth in hardiness, gentleness, honey production and disease-resisting qualities. Untested, each, 1.25; 6, \$.65; 12, \$12.00; 50, \$47.50; 100, \$90. Your correspondence will receive prompt attention and I guarantee satisfaction. A. E. Crandall, Berlin, Conn.

Golden Italian queens that produce golden bees; the highest kind, gentle, and as good honey-gatherers as can be found; May to August, untested, each, \$2.00; six, \$8.00; doz., \$15.00; tested, \$4.00; breeders, \$5.00 to \$20.00. J. B. Brockwell, Barnetts, Va.

FOR SALE.—By return mail, tested Italian queens, \$2.50 each; untested queens ready May 1, \$1.25; 12, \$13.50. No disease and all queens guaranteed to be the best.

J. W. K. Shaw & Co., Loreauville, La.

THE ITALIAN QUEENS OF WINDMERE are superior three-band stock. Untested, \$1.50 each; six for \$8.00; tested, \$2.00 each; select tested, \$2.50 each; virgins, \$1.00. Nuclei for sale.

Prof. W. A. Matheny, Ohio University, Athens, O.

FOR SALE.—Three-band leather-colored Italian queens. Safe arrival guaranteed. No disease. Hustlers, none better. 1, \$1.00; 12, \$10. Write for circular and prices on quantities.

J. M. Cutts, R. D. No. 1, Montgomery, Ala.

FOR SALE.—Quirin's hardy northern-bred Italians will please you. All our yards are wintered on summer stands; more than 25 years a commercial queen-breeder. Tested and breeding queens ready almost any time weather permits mailing. Untested ready about June 1. Orders booked now. Testimonials and price for asking.

H. G. Quirin, Bellevue, Ohio.

ITALIAN QUEENS.—The Old Reliable three-banded Italians, the best all-around bee to be had. Queens ready to mail April 1, 1920. Will book orders now. Will guarantee safe arrival in United States and Canada. Prices for April and May: Untested, \$1.50; 6, \$8.00; 12, \$15.00. Tested, \$2.25; 6, \$12.00; 12, \$22.00. Select tested, \$3.00 each. Descriptive circular and price list free.

John G. Miller, 723 C St., Corpus Christi, Texas.

1920 prices on nuclei and queens. Miller strain. Queens, untested, \$1.50 each; \$15.00 per doz.; tested, \$2.00 each, \$22.00 per doz. One-frame nucleus, \$3.00; two-frame, \$.50; three-frame, \$.65, without queens, f. o. b. Macon, Miss. We have never had any bee or brood disease here. Will have no queens except for nuclei until June 1. Safe arrival and satisfaction guaranteed.

Geo. A. Hummer & Sons, Prairie Point, Miss.

Mr. Bee Man, if you are a subscriber to Gleanings you know we are growing; so why not order your wants from us. Nine years' experience in shipping bees all over U. S. and Canada. All bees are shipped on a standard frame of brood and honey, the safest way to ship. Prices, 2-lb. package bees with one untested three-banded Italian queen, \$5.75; 3-lb. same as above, \$7.00; 5-lb. swarm, the real star, \$9.00. A few hybrid bees from outyards. But remember all queens are reared from our home queen yard. 5 per cent discount on 25 or more packages. Safe delivery guaranteed, also free from disease of any kind. Can start shipping May 10. Oscar Mayeux, Hamburg, Box No. 15, La.

TESTED QUEENS.—I make a practice of requeening all my colonies each year with young queens. I am going to offer the tested queens for sale. They are descended from the Moore strain of leather-colored Italians. Only one year old this coming summer, right in the prime of their lives, just old enough to thoroughly test them. I will begin mailing the queens the last of June, and finish in July. I like to have enough orders in advance to take them all, as I can work to better advantage in requeening. I will receive and book orders now, and will fill in rotation when I begin mailing them. Price, \$2.00 each; 12 for \$22.00. A few choice breeding queens, some two years old for \$5.00 each. Safe arrival and satisfaction guaranteed.

Elmer Hutchinson & Son, Lake City, Mich.

MISCELLANEOUS

Eleven months Rufus Red Belgian does, bred, \$3.00 each.

Erwin's Stock Farm, Walled Lake, Mich.

Annual White Sweet Clover seed, trial packets at \$1.00 per packet, postpaid.

Henry Field Seed Co., Shenandoah, Iowa.

No ants where tansy grows. Get it started this spring. 3 plants, 25c.

M. D. Smith, Preston, Iowa.

Write for shipping tags and our prices for rendering your old combs, cappings, etc. We guarantee a first-class job. The Deroy Taylor Co., Newark, N. Y.

HELP WANTED

WANTED.—Man to work with bees. Board furnished. State age, experience, and wages wanted in first letter. Mathilde Candler, Cassville, Wisc.

WANTED.—A competent beekeeper to work bees in southern New Mexico. Must be thoro and fast worker. Mesilla Valley Honey Co., Canutillo, Tex.

WANTED.—Experienced man for comb honey. Give age, experience, and salary expected.

B. F. Smith, Jr., Fromberg, Mont.

WANTED.—A competent young man to help care for 300 colonies of bees and other work. Capable of running a Ford car. State experience and wages wanted.

J. W. Hackney, Weldona, Colo.

WANTED.—A good queen-breeder, begin at once. An opportunity to learn the package business and a good position for the right man. State age, amount of experience, and salary wanted in first letter.

W. D. Achord, Fitzpatrick, Ala.

WANTED.—We can use an experienced man in extracted-honey production during the season of 1920. Applicant kindly state age, experience, and wages expected in first letter, and oblige.

E. D. Townsend & Sons, Northstar, Mich.

WANTED.—Man, season of 1920, to work with bees. State age, experience, and wages. Give reference. Permanent employment to right man. The Rocky Mountain Bee Co., Box No. 1369, Billings, Mont.

WANTED.—One experienced beeman and one helper. Must be young man, able-bodied, and with good character. Prefer one man that can handle auto truck. State salary and give references when answering. Ernest W. Fox, Fruitdale, So. Dak.

WANTED.—One experienced man, and students or helpers in our large bee business; good chance to learn. Modern equipment and outfit, including auto truck, located near summer resorts. Write, giving age, height, weight, experience, reference, and wages wanted.

W. A. Latshaw Co., Clarion, Mich.

SITUATIONS WANTED

WANTED.—Position on bee farm near Connecticut this summer.

J. Hodous, 9 Sumner St., Hartford, Conn.

TRADE NOTES

REMARKABLE BEE DISCUSSIONS.

In *Gleanings in Bee Culture* for the year 1911 appeared several rare series of articles on beekeeping by beekeepers of exceptional ability. These were "Beekeeping for Beginners," 12 articles, by E. D. Townsend; "Beekeeping in Florida," 13 articles, by E. G. Baldwin; "Beekeeping as a Hobby," 5 articles, by F. Dundas Todd; "General Topics of Beekeeping," 9 articles, by S. D. House. This volume of 1911 was one of the best ever published by the Editors of *Gleanings*. We chance to have 55 bound volumes of the year 1911 (a very little shelf-worn, some of them) that we will sell, postpaid, at \$1.25 each. First come, first served. Address *Gleanings in Bee Culture*, Medina, Ohio.

BOOK YOUR ORDERS NOW FOR ROOT QUEENS.

Raised in our famous Home Yard, Basswood Yard, Wardell Yard, and Maple Grove Yard, by our experienced queen-breeders, Mell Pritchard, Arlie Pritchard, and John Mossgrove.

Special Contract Prices: Write immediately for special contract prices, stating quantity wanted, date of delivery desired, and whether tested or untested.

THE A. I. ROOT CO., Medina, Ohio, U. S. A.

Books and Bulletins

The following is from the "Foreword" of "North American Honey Plants," by Frank C. Pellett: "In the first volume of *American Bee Journal*, published in 1861, appears a plea for the publication of a volume devoted to the honey flora of America. In numerous instances since that time, writers have mentioned the great need of a work of this kind. In common with other students of beekeeping, the author came to feel this lack in our beekeeping literature. This book is an attempt to fill that need. It is to be expected that the first work on this great subject will overlook many things which should have been included and that numerous errors should creep in. In an attempt to gather the desired material the author has visited the important beekeeping regions from the Atlantic Coast to California and from Canada to Florida and Texas."

After an interval of nearly 60 years one of the present editors of the same journal has published a book to meet the need expressed by the first editor of the *American Bee Journal*. It cannot but occasion surprise that a book on this phase of bee culture has not appeared before; but the honey plants were and still are very imperfectly known, and the interest of the majority of beekeepers has centered perhaps too closely on apparatus and methods of honey production. Mr. Pellett has given brief but clear and interesting descriptions of all the more important North American plants, north of Mexico, valuable as sources of pollen and nectar, arranged in alphabetical order. The book is illustrated by 155 figures, which will add much to the pleasure of the reader and should greatly aid in the identification of the species. Interspersed among the descriptions of the plant are articles on pollination, pollen, nectar-secretion, honeydew, weather, etc. The more important honey plants of the different States are also enumerated.

Under the description of sage, Chadwick's statement that in 30 years the sage ranges of California will be almost a thing of the past is quoted (see page 231). This may be true for his locality. The Editor has traveled over all of California and is convinced that there is as much black and purple sage as there ever was, altho there may be less of white sage. While the acreage of sage in general may be slightly less, there are more bees and beekeepers to gather it. In a good year there will, therefore, be more sage honey produced than in former times. This opinion was confirmed by Dr. Phillips in conversation with the Editor at the recent short course in beekeeping held at Columbus, Ohio. Sweet clover is said to secrete nectar most abundantly in the hot dry climate of the plains region west of the Mississippi River. It is further pointed out by Pellett that the aid of the minor honey plants and of the pollen flowers in building up the colonies may often in a large measure determine the size of the surplus.

Few beekeepers know much about the honey plants outside of their own locality. Many are unable to distinguish the plants, which yield pollen only, from those which are nectariferous, and erroneous beliefs are often more hurtful than actual ignorance. A book of reference is a necessity and this valuable volume will doubtless give a new impetus to the study of the American honey flora. A course in botany, indeed, should form a part of the training of every young beekeeper. There are great possibilities in the study of the honey plants, and it is safe to say that they will never be neglected again as they have been in the past. Mr. Pellett is to be congratulated on the production of the first book dealing with a phase of bee culture, which the late Mr. Doolittle declared was second to no other in importance.

QUALITY QUEENS ^A_T QUANTITY PRICES

BREED THREE-BAND ITALIANS ONLY

	PRICES for 1920			Before July 1st			After July 1st		
	1	6	12	1	6	12	1	6	12
Untested	\$1.75	\$ 9.00	\$16.00	\$1.50	\$8.00	\$14.00			
Select untested..	2.00	10.00	18.00	1.75	9.00	16.00			
Select tested....	3.00 each			2.75 each					

Queens are reared from mothers whose colonies are gentle, hardy, and as honey gatherers are hustlers. Each and every queen reared by the latest and most approved methods, thus insuring queens that are capable of duplicating the excellent characteristics of their mothers. Satisfaction and safe arrival guaranteed in U.S. and Canada. Anticipate your needs and place your order now.

HERMAN McCONNELL :- :- :- :- ROBINSON, ILLINOIS

AT SIOUX CITY, IOWA

YOU HAVE A MARKET
FOR YOUR HONEY AND
BEESWAX

WESTERN HONEY PRODUCERS
SIOUX CITY, IOWA Address Dept. C

When you have honey for
sale send sample and state
the price you want delivered
here.

You have a stock of Lewis
Beeware at your command.

Send list of your wants and
lowest prices will be quoted
at once.

1920 QUEENS 1920

A colony of bees with a poor queen is worth the hive and fixtures. A colony of bees with a good queen has no limit in value, the honey flow alone being the determining factor. I am using my thirty-five years of beekeeping and queen-rearing experience to produce the best that can be produced, and sell at a figure that will sustain the high quality of my queens.

PRICES

One, \$2; three, \$5.50; six, \$10; twelve, \$19. All amounts over one dozen, \$1.50 each. I sell only untested queens and make a specialty of this line. I select no queens, but try to have them all so good that there is little chance for selection. 1920 circular now ready.

Season opens April first.

P. C. CHADWICK

KERN COUNTY

DELANO, CALIF,

SOUTHERN HEADQUARTERS THE OLD RELIABLE BREEDERS OF THREE-BANDED ITALIAN BEES AND QUEENS

PRICES UNTIL JUNE 15

Untested queens, \$1.25 each; 12, \$13.25; 50 or more, \$1.00 each
Select untested queens, \$1.50 each; 12, \$16.00; 50 or more, \$1.25 each
Tested queens, \$2.00 each; 12, \$23.00
Select tested queens, \$2.50 each; 12, \$27.00
Very best breeding queen, \$5.00

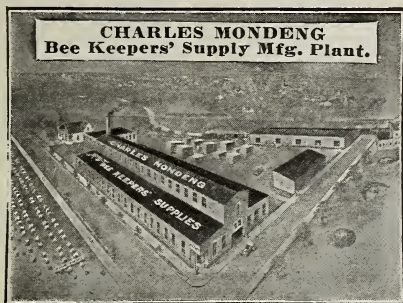
Prompt service, safe arrival and satisfaction guaranteed. If any of our untested queens prove to be mated we will replace free of charge. No foul brood or other contagious bee disease has ever been in our vicinity.

Please let us have your orders now for June delivery.

W. D. ACHORD, FITZPATRICK, ALA.



\$30,000 WORTH OF Bee Supplies



All boxed ready to ship at once, 275,000 Hoffman frames; also Jumbo and Shallow frames, of all kinds, 100 and 200 in a box. Big stock of Sections, and fine polished Dovetailed Hives and Supers. I can give you big bargains. Send for a new price list. I can save you money.

Will take Beeswax in Trade at Highest Market Price.

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146 Newton Ave., N. Minneapolis, Minn.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant for 1920. We are paying higher prices than ever for wax. We work wax for cash or on shares.

Root's Bee-supplies

Big stock, wholesale and retail. - Big catalog free.

Carl F. Buck

The Comb-foundation Specialist
Augusta, Kansas

Established 1899

The Golden Tape

A golden tape is reeled before you every day. You cannot stop it, nor retard it, nor hurry it.

And having passed, no power can recall it.

It is absolutely free. You can coin every inch of it and use the coin, or you can let it roll by, untouched by your effort.

It travels fast, and no man yet has coined his full quota.

What is your average?

The golden tape is—TIME.

—H. A. Nelson.

Are You Prepared?

Are you ready, Mr. Beekeeper, to coin the valuable days of flower bloom? They will be here before we realize it. Are you prepared, and ready with sufficient excess supplies, and with the new foundation? Have you enough sections and frames?

We are anxious to serve you in all departments of your work. We are so located as to be able to give you unusually prompt and direct shipments. Let us help you coin the golden tape. We solicit your business and guarantee to satisfy you. Use us.

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Council Bluffs, Iowa

Get Churn Free



Make more and better butter. Over 25,000 Leader Churns sold, 7,000 testimonials. A. N. Hollis, says: "Churning was a burden until we got the Leader. Now the children cry to churn. We churn in 3 or 4 minutes." Leader Churns built to last lifetime—light weight—easily cleaned.

Churns in 3 Minutes

Sold under two plans—1st. Simply order Churn; pay after 30 days trial; 2nd. Take orders from your friends—your commission quickly pays for Churn, then you get your Leader Churn FREE. ORDER NOW.

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Gallons

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Gallons

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Send No Money Order direct from this adv. checking size of Churn wanted. You pay express charge only.

AGENTS WANTED—take trial orders; no money needed.
Novelty Mfg. Co., Box 806, Abingdon, Ill.

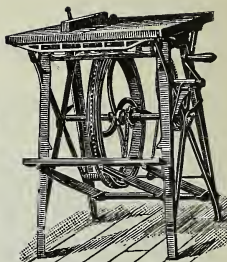
BARNES' Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices

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NINE MONTHS TO PAY

Immediate possession on our liberal **Easy Monthly Payment** plan—the most liberal terms ever offered on a high grade bicycle.

FACTORY TO RIDER prices save you money. We make our bicycles in our own **new model factory** and sell direct to you. We put real quality in them and our bicycles must satisfy you.

44 STYLES, colors, and sizes to choose from in our famous **RANGER** line. Send for big beautiful catalog.

Many parents advance the first payment and energetic boys by odd jobs—paper routes, delivery for stores, etc., make the bicycle earn money to meet the small monthly payments.

DELIVERED FREE on Approval and **30 DAYS TRIAL**. Select the bicycle you want and terms that suit you—cash or easy payments.

TIRES lamps, horns, wheels, sundries and parts for all bicycles—at half usual prices. **SEND NO MONEY** but write today for the big new catalog, prices and terms.

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"Best" Hand Lantern



A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. Agents wanted. Big Profits. Write for Catalog.

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QUALITY AND SERVICE

Now is the time to order your season's supply of Bee Material so as to have them ready for the honey flow. For lack of hives and other goods, you cannot afford to let your bees fly away. *Bees are valuable.* We have every thing required for practical beekeeping. Our goods for Ideal of quality, quality of workmanship. Our 1920 catalog is now ready to send out; send for one. It is full of good stuff.

AUGUST LOTZ COMPANY :- BOYD, WISCONSIN

QUEENS THAT PLEASE

This is my fifth year of queen-rearing at Penn, Miss. During these years I have produced thousands of queens that have been bought by beekeepers thruout the United States and many foreign countries. My queens in the past have given universal satisfaction. This year I am under my own management, and am more than ever capable of pleasing you. If you have never bought queens here you should, and a trial order will convince the most skeptical. There's a reason why I have reared more queens in a single season than any other queen-breeder. You must be pleased or your money will be cheerfully returned. Prices are as follows:

	Before July 1st			July 1st to Nov. 1st		
	1	6	12	1	6	12
Untested	\$2.00	\$ 8.50	\$15.00	\$1.25	\$ 6.50	\$11.50
Select Untested	2.25	9.50	16.00	1.50	7.50	13.00
Tested	3.00	16.50	30.00	2.00	10.00	18.50
Select Tested	3.50	19.50	35.00	2.75	15.00	27.00

Terms strictly cash, fourth with order, balance before shipping. Safe arrival guaranteed. U.S. inspected.

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The Kind You Want and The Kind
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We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co's brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies for cash.

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"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

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Florida Queens and Bees

I will be fully ready to begin shipping bees and queens by April the 1st from my very best Italian stock at these prices: Two-frame nucleus with untested queen, \$6.00. Untested queens, \$1.50; tested, \$2.00.

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I have a large and complete stock and prices are right. Get prices of my Cypress hives and hive parts, made of good soft Southern Cypress.

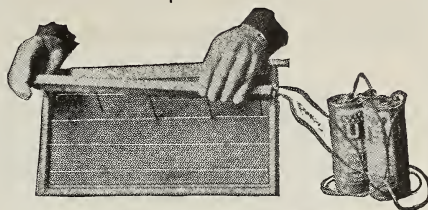
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This monthly publication deals with beekeeping and Dixie for beekeeping.

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Price without Batteries, \$1.25

Actually cements wires in the foundation. Will work with dry cells or with city current. Best device of its kind on the market. For sale by all bee-supply dealers.

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ROUTE 1 MANCHESTER, TEXAS

will rear the well-known Murry Strain of 3-banded Italian Queens at the following

Prices	1	6	12
Untested	\$1.50	\$ 8.00	\$14.50
Tested	2.50	12.00	22.00
Select tested	3.00	16.50	30.00

Breeders, 5.00 to \$10.00

A limited number of 2-frame nuclei with untested queens at \$6.50 each, f. o. b. our shipping point. Safe arrival at your express office guaranteed. Some of this strain of bees stored 375 pounds of surplus honey per colony in 1919.

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ING**

ITALIAN QUEENS

Untested - - \$1.50 each; 25 or more, \$1.35

Tested - - - 2.50 each; 25 or more, 2.25

Select tested, each - - - - - 3.00

Circular free. All letters answered promptly and cheerfully.

R. V. STEARNS, BRADY, TEX.

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BRED FOR QUALITY.

My Three-band queens are bred from imported stock; they are hardy, prolific, gentle, disease-resisting, and honey-producers.

Untested.....	\$1.50	6, \$7.50	12, \$13.50
Select Untested.....	\$1.75	6, \$9.00	12, \$16.00

I guarantee pure mating, safe arrival, and perfect satisfaction, circular free.

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DON'T FORGET!

We can supply bees and queens at attractive prices. Queens are bred from celebrated Pritchard stock. Improve your apiary with some of the vigorous young stock with which we can supply you.

We are now able to supply you with our new process foundation. Being the originators and developers of comb foundation it is perfectly fitting that we should now bring out this superior product. Try other makes; *then try ours*—and you never have any other.

SUPPLIES

We can furnish you with anything and everything, prices consistent with the high quality of the goods, all things considered.

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AM NOW BOOKING ORDERS FOR

MICHIGAN - BRED QUEENS

THREE-BANDED ITALIANS ONLY

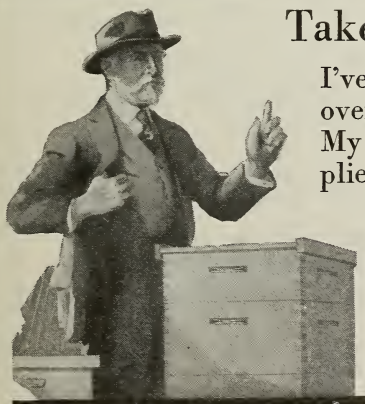
TESTED DISEASE-RESISTERS

PRICES

	June 15 to July 15			July 15 to Oct. 1			
	1	6	12	1	6	12	100
Untested	\$1.50	\$8.00	\$15.00	\$1.30	\$7.50	\$13.50	\$110.00
Select Untested	1.75	9.00	16.00	1.60	8.00	14.00	115.00
Select Tested any time after June 20.....				3.00	16.00	29.00	
Select Day-old Virgins after June 1.....				.60	3.50	6.50	50.00

All queens hatched in nursery cages, and any inferior ones are killed. All queens mated in two-frame or three-frame nuclei. No baby nuclei in yard. Books opened April 1. If you are going to need *good* queens this summer, now is the time to order them.

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I've used "**falcon**" queens and bee supplies over 20 years. Always had luck with them. My advice to you is: "Let "**falcon**" supplies start you on the right road. Swarms of successful apiarists say the same thing. For over 40 years "**falcon**" supplies have been marketed wherever high quality is recognized. Experienced beekeepers buy them year in and year out.

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Write for Red catalog and "Simplified Beekeeping." Order at once.

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PREPAID FOR ONLY

\$800



FEED the hopper, turn the wheel, and enjoy making your own wholesome whole wheat or graham flour, old-fashioned corn meal, rye flour, chops and hominy, and *bring down living cost*. Best coffee and spice grinder. If you have poultry, grind your chicken feed, save feed money and get more eggs.

Apache grinding plates of special mixture iron made to give longest wear. Steel ball bearings make it only a boy's job to run it. Send money or check today. Satisfaction guaranteed. For the present we can make prompt delivery. So don't delay.

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The Apache Grist Mill is companion to the Black Hawk Corn Sheller, famous for 35 years for its "Can't Wear Out" Guarantee.

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Italian Queen bees for sale. Northern-bred, for business from my best, *Superior Breeders*; gentle roll honey in, hardy, winter well, not inclined to swarm, three banded. Queens a specialty, twenty-six years breeding experience. Satisfaction guaranteed. Safe arrival in U. S. and Canada.

Untested . . \$1.40; 3, \$3.75; 6, \$7.00; 12, \$13.00
Select Unt. . \$1.65; 3, \$4.50; 6, \$8.50; 12, \$16.00

I. F. MILLER, Rt. No. 2, BROOKVILLE, PA.

Queens--Rhode Island--Queens

Italian Northern-bred queens. Very gentle and hardy. Great workers. Untested, \$1.25 each; 6 for \$7.00. Circular on application. Queens delivered after June 1.

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56 Lawrence Street

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WANTED.—A permanent home with bees. Christian. W. Jensen, Mars Bluff, S. C.

FOR SALE.—25 colonies in 10-frame hives, Hoffman frames, good combs, inspected, \$20.00 each. S. K. Blundin, Oxford Valley, Pa.

FOR SALE.—One wax press and one extractor. Good condition. \$25.00 for both. J. E. Christman, Wellston, Ohio.

FOR SALE or exchange for farm land or merchandise, building, 9 town lots, with one-half acre golden seal, shaded with bushes. S. Pitts, Stronghurst, Ills.

FOR SALE.—Bees in 10-frame hives.

Julius Gentz, Wabeno, Wisc.

FOR SALE.—Palmetto honey in 5-gallon cans, 16c; in cypress barrels, 400-lb. capacity, 15c, f. o. b. Florida. Ward Lamkin, Arcadia, Fla.

FOR SALE.—Hardy Italian queens. One dollar each for the month of May.

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SIMMONS.—Goldens and three bands, prize-winning strain. Also nucleus.

Allen Simmons, Claverack, N. Y.

FOR SALE.—One Root automatic reversible hand or power L. six-frame slightly used honey-extractor in fine shape at half price of new one.

M. J. Wilsey, Washington, Kans.

FOR SALE.—Best three-banded Italian queens ready June 10. Untested only, one, \$1.50; 6, \$8.00; 12, \$15.00. Book orders now.

Ross B. Scott, LaGrange, R. D. No. 4, Ind.

FOR SALE.—Pure Italian queens, packages and nuclei. One untested queen, \$1.50; 6, \$7.50; 12, \$13.50; 50, \$55.00; 100, \$100.00.

Golden Star Apiaries, San Jose, Calif.

FOR SALE.—A bee outfit, five double-walled Root hives, supers, etc., practically new, \$78 worth for \$45.

Louise Sperry, 307 N. Main St., Mt. Vernon, O.

FOR SALE.—60 colonies of bees in 10-frame standard hives, run for extracted honey. Honey-extractor, wax-extractor, up-to-date outfit. Sickness my reason for selling.

J. H. Hill, Okeechobee, Fla.

FOR SALE.—Victor's Italian Queens, prompt service, courteous treatment, and painstaking effort are my inducements for your patronage. Mated, \$1.25 each, six, \$7.00; twelve, \$13.50, from June 1 to Oct. 1.

Julius Victor, Martinsville, N. Y.

WANTED.—BEESWAX. During May I will pay 40c per lb. cash for average yellow beeswax, delivered here. State quantity and quality and await reply before shipping.

E. S. Robinson, Mayville, N. Y.

FOR SALE.—I have sold my bees but still have for sale a fine equipment for production of extracted honey on large scale, a full and complete line, and in good condition. Reason for selling, am not able to work.

O. H. Townsend, Lake City, Mich.

SPECIAL PRICE.—Overstock sale, on one-story 8-frame S. W. hives, shipping cases to hold 24 sections, 4 1/4 x 4 1/4 x 1 1/2, Hoffman frames 1 1/2-inch spacing. Modified frames, Jumbo depth, 1 1/2-inch spacing. Ask for quotations.

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WANTED.—To hear from beekeepers wanting queens from three-banded Italian stock which for the last ten years made the highest average per colony of any bees in Indiana. All orders accepted to be filled after May 20. Untested queens, May and June, \$2.00 each, 6 for \$10.50.

Charles Kennard, Knightstown, Ind.

FOR SALE.—100 four-frame nucleus hives in lots of 5 or more. The frames used just fit cross-wise in any regular 10-frame deep super, same holding 13 nucleus frames. Just the thing for expert or beginner. All hives have good galvanized telescope covers and are painted inside and out. All clean, in first-class condition and absolutely free of any disease. Price, empty, 75c each; with 3 frames of full drawn honey, \$1.50 each, f. o. b. Marion. Write for particulars.

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BE FOREHANDED

Mr. Beekeeper and anticipate your needs for the coming season and order early. Root's goods in stock at factory prices. Send for 1920 catalog.

F. D. Manchester R. D. No. 2 Middlebury, Vt.

INDIANOLA APIARY

Will furnish 3-banded Italian Bees and Queens as follows: Untested Queens, \$1.00; Tested, \$1.50. Nucleus, \$2 per frame, queen extra.

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NEWMAN'S ITALIAN QUEENS

Bred from the best. No disease. Satisfaction and safe arrival guaranteed.

Untested, \$1.25; 6, \$7.00; 12, \$13.50. Select Untested, \$1.75; 6, \$9.00; 12, \$17.00. Circular free.

A. H. NEWMAN, - - MORGAN, KY.

FOR SALE--THREE-BAND ITALIAN QUEENS

From best honey-gathering strain obtainable. (No disease.) Untested queens, \$1.25 each; 6, \$6.50; 12, \$12. Select untested, \$1.50 each; 6, \$9; 12, \$18. Tested, \$2.50 each. Safe arrival and satisfaction guaranteed. Your orders filled promptly.

W. T. PERDUE & SONS Rt. 1, Fort Deposit, Ala.

FOR SALE — HIVES.

100 new standard dovetailed, 10-frame hives, never used, nailed, painted two coats white paint, one-story hives complete with Hoffman frames and full sheets foundation, \$3.00 each. Also 100 extra bodies used one year as supers for extracting, with frames but no foundation, \$1.00 each. All painted white and in fine condition. Cash bargain.

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Patent Counsel of The A. I. Root Co.
Chas. J. Williamson, McLachlan Building,
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Branch of The A. I. Root Company

Prompt and Efficient Service **BECAUSE—Only Root's Goods are sold.**
It is a business with us—not a side line.
Eight mails daily.
Two lines of railway.
If you have not received 1920 catalog send name at once.

BEES We furnish full colonies of Italian bees in double-walled hives, single-walled hives, shipping-boxes, and three-frame nucleus colonies.

I. J. STRINGHAM, GLEN COVE, Nassau Co., N. Y.

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England: If you do not have a 1920 catalog send for one at once.

H. H. Jepson, 182 Friend St., Boston, Mass.

TREES and SHRUBS

Of Highest Quality at living prices. Pleasing, prompt service. No money with order. We pay the freight and guarantee satisfaction. If interested, ask for 1920 Catalog. It explains.


THE PROGRESS NURSERIES

1306 Peters Avenue

TROY, OHIO

HYBRID POTATO SEED

Every seed will produce a new VARIETY of potato, some white and some red, some early and some late, no two alike, 100 or more seeds in each package. One package and three months' subscription to our Magazine, "Special Crops," regular price \$1.00; special price three months and seeds, 25 cents. PUBLISHER OF SPECIAL CROPS, SKANEATELES, N. Y.



The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed. Write for catalog. AGENTS WANTED EVERYWHERE.

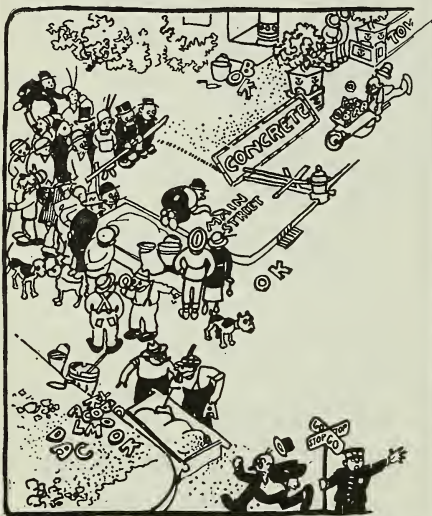
THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

NEW ENGLAND BEEKEEPERS

WE HAVE A LARGE STOCK OF ROOT'S SUPPLIES AND CAN GIVE YOU PROMPT SHIPMENT, SAVING YOU TIME AND TRANSPORTATION CHARGES. TRY US WITH YOUR ORDERS. CATALOG ON REQUEST.

F. COOMBS & SONS -:- BRATTLEBORO, VERMONT

A RED LETTER DAY IN CONCRETE TOWN



That Sign for Your Apiary

SHOULD BE MADE THIS SPRING!

We will mail you on application a small folder on how to make your own signs by using our all-weather-proof burned clay letters. They can be used on buildings, walks, lawns or roadside.

Write for a "Red Letter
Day in Concrete Town"

UNITILE
REGISTERED TRADE MARK

The Unitile Co., Columbus, Ohio
Dept. B

DOLL SAYS

don't invite Disappointments by delay in ordering your Honey Containers. Make sure of having all the Cans and Bottles you will need, by ordering them NOW. I am splendidly prepared to fill all orders for Friction Top Cans of 3 lbs. to 10 lbs. capacity—5-gallon Square Cans—and ½-lb. to 3-lb. white flint glass Screw Top Honey Bottles. Standard-grade goods, at prices that will interest you.

AN EASY WAY TO SAVE MONEY

You can save 15 per cent to 20 per cent on the cost of your Honey Cans and Bottles this year, by ordering them from DOLL—and instructing us to ship direct from factory to you.

I am also ready to make prompt shipments of anything wanted in the way of White Pine Hives, supers, extractors, Foundation, and other Supplies—none better to be had in either Style, Quality or Construction.

BE ready when the Honey begins to flow, by GETTING ready NOW.

Be sure to get my price quotations
before ordering this year's Supplies.

P. J. DOLL BEE SUPPLY CO.

NICOLLET ISLAND

MINNEAPOLIS, MINN.

HERE THEY ARE, MR. BEEKEEPER, AT NEWARK

Wayne County, New York, ready to answer your call, the best of everything!!

Just Read This List

Lewis Beeware, Sections, Shipping Cases, Frames, Hives, Hershiser Wax Press, and other supplies.

Dadant's Unexcelled Foundation, all standard weights and sizes. Also the Electric Wire Imbedder.

Bingham Uncapping Knives, including steam-heated with oil stoves and generators.

Bingham Smokers, all sizes, with genuine leather bellows.

Root's Extractors, all sizes of hand and power Machines.

Bee Books written by all leading authors in beedom.

All Sizes of Friction-top Pails and also 60-pound Cans, new and second-hand. Also Cement-coated Nails for nailing beehives and supplies.

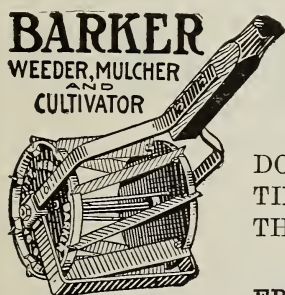
All-sized Spools of Tinned Wire, Bee Brushes, Feeders, Queen-rearing Cages, Bee Gloves, Capping Melters, and all practical supplies you will need.

A Market for your Honey or Wax, and a plant to render your Old Combs and Cappings.

Over 1,000 Beekeepers took advantage of this Service Station at Newark in 1919, for the first time. Now *all together* for a greater 1920.

New Catalog Free, and Our Discounts Will Save You Money. Address

The Derooy Taylor Co., -:- Newark, Wayne Co., New York



Weeds and Mulches In One Operation

DOES BETTER WORK THAN A HOE—TEN TIMES AS FAST—SAVES TIME AND LABOR, THE TWO BIG EXPENSE ITEMS—EASY TO OPERATE.

FREE—Illustrated Book and Factory-to-User Offer

We want every garden grower to know just how this marvelous machine will make his work easier and increase his profits. So we have prepared a book showing photographs of it at work and fully describing its principle. Explains how steel blades, revolving against a stationary knife (like a lawn mower) destroy the weeds and at the same time break up the crust and clods and pulverize the surface into a level, moisture-retaining mulch.

"Best Weed Killer Ever Used"

LEAF GUARDS—The Barker gets close to the plants. Cuts runners. Has leaf guards; also easily attached shovels for deeper cultivation—*making three garden tools in one.*

A boy can use it. Five sizes. Send today for book, free and postpaid.

**BARKER
MFG. CO.
Dept. 10**

DAVID CITY, NEB.

Gentlemen. — Send me postpaid your free book and Factory-to-User Offer.

BARKER MANUFACTURING CO.

Dept. 10

David City, Nebraska

Name _____

State _____

Town _____

R. R. No. _____ Box _____

Well, Mr. Beekeeper:

Pretty near time you
sent in that order
isn't it?

Summer will soon
be here you know
and you will
want your
supplies
in a
hurry.

We want to help
you all we can.
Send in
your
order now
and we
will
do our
part.

Are

Veils

You

Smokers

Going

Tools

to

Hives

Syracuse

Supers

for

Sections

Supplies?

Foundation

Extractors

We are in
the market
for bees-
wax. Write
us for
prices.

If you
haven't our
catalog
drop us a
card and we
will mail
you one.

Try us.
You will
come again.

F. A. Salisbury, 1631 W. Genesee St., Syracuse, N. Y.

QUEENS

FINE ITALIAN QUEENS FROM

SELECTED BRED-UP STOCK

Pure mating, safe arrival,
and satisfaction guaranteed.
Now booking orders for June
delivery at following prices:

	1	12	100
Untested - - -	\$1.35	\$15.00	\$110.00
Select Untested	1.75	18.00	150.00
Tested - - - -	2.50	24.00	200.00

A few more
PACKAGE BEES
for late May and early
June delivery.

E. A. HARRIS, ALBANY, ALA.

QUEENS

FROM SELECT BREEDING

Twenty Years of Experimenting. We
have nothing but the very best.

3-Band Only

Price Cash With Order
Before July 1st

Untested - - - -	\$2.00
Selectd - - - -	2.25
Tested - - - -	3.00
Selectd - - - -	3.50

Orders filled in rotation.
Write for prices in large
quantities.

Did you get what you were looking
for when you bought your last year's
Queens? If not, try one that will
please you. My queens are reared on
a new system, large and prolific, sur-
passed by none but superior to many.

F. M. RUSSELL

ROXBURY, OHIO R. F. D. No. 2

QUEENS OF QUALITY

FARMER'S QUEENS SPEAK FOR THEMSELVES.

Mr. Beekeeper, why not get a good queen while you are buying? Farmer's queens produce workers that fill the supers quick with honey that is most delicious to eat. They are bred for honey production strictly. Shipping season is here; now is your time to head your colonies with a good queen; one that will keep the hive chock-full of bees at all times, makes the biggest yields of honey, sting less and look the prettiest. Our strain of Italians will go a long distance after nectar; in a high degree they are very resistant to disease, gentle and beautiful, not given to swarming, hardy, long-lived. We breed from imported stock from Italy, the very best obtainable for honey-gathering; they are known thruout the world; they don't need any recommendation.

PRICES FROM APRIL TO JULY:

	1	6	12	100
Untested	\$1.50	\$7.50	\$13.50	\$1.00 each
Select untested	1.75	9.00	16.50	1.25 each
Tested	2.50	13.00	24.50	2.00 each
Select tested	4.00	22.00	41.50	3.35 each

Guarantee? You take no risk when you buy our queens. We guarantee them to reach you safely, to be purely mated, and we leave the word satisfaction entirely to purchaser; he is the sole judge. Why we do this is because we know what we are going to send out. If they don't prove up to your satisfaction, return them and your money will be refunded. Shipments made on time. Reference to our standing: Bank of Ramer, Ramer, Ala.

The Farmer Apiaries . . . Ramer, Alabama

"Where the Good Queens come from"

Forehand's Three Bands

THE THRIFTY KIND

We have been breeding these queens for the market for over a quarter of a century. They are bred from the imported Italians, but after years of select breeding we have brightened the color and retained the good qualities of their mothers.

After years of select breeding we have built up a strain of bees that are surpassed by none but superior to many. Our queens are thrifty, hardy, gentle, and beautiful.

PRICES

After April 1, to July 1

Kind	1	6	12	100, each
Untested	\$1.50	\$7.50	\$13.50	\$1.00
Select Untested	1.75	9.00	16.50	1.25
Tested	2.50	13.00	24.50	2.00
Select Tested..	4.00	22.00	41.50	3.35

Pound Bees from April 15 to June 30

Size	1	25 or more
One-pound package.....	\$3.00	\$2.75
Two-pound package.....	5.00	4.60
Three-pound package.....	7.00	6.45

Add the price of the queen wanted.

We guarantee pure mating, safe arrival and satisfaction.

W. J. FOREHAND & SONS -:- FORT DEPOSIT, ALA.
THE BEE MEN

QUEENS Package Bees QUEENS

Did you read Prof. H. F. Wilson's write-up in the March issue of Gleanings, in regard to the packages of bees he received from me last year? Notice he said some of those

PACKAGES RECEIVED IN MAY GAVE 150 LBS. OF HONEY

That speaks for the quality of our *queens*. The 2-pound packages with Queens shipped to Mr. David Running (then President of the National Beekeepers' Association) in 1917, three years ago, gave him 140 pounds that season. Have booked all I can guarantee shipping on time for April, but send for *Free Circular* for later shipping which states our guarantee, also gives prices on bees by parcel post, Nuclei, etc.

THREE-BANDED AND GOLDEN QUEENS.

Have secured the best queen men obtainable and we are prepared to turn out 6,000 queens per month. They do nothing but rear the best of *queens*; careful inspection before shipping. Have an entirely separate crew for shipping bees, etc. Twenty years a beekeeper.

Prices f. o. b. Here, by Express.

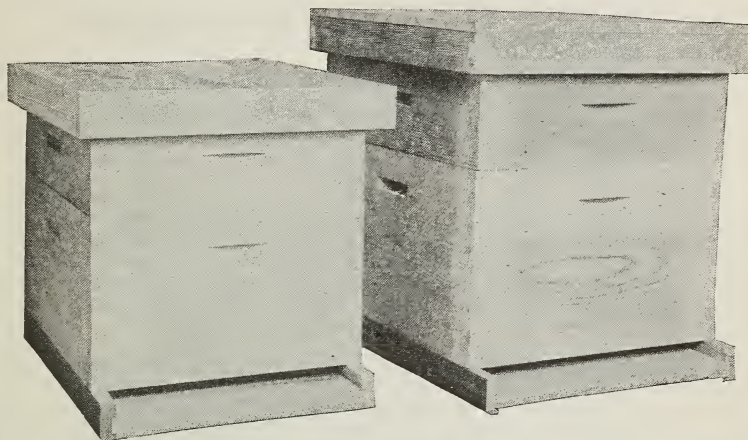
Queens.

1-lb. pkg. bees, \$2.40; 25 or more... \$2.16	Untested, \$1.50 each; 25 or more.... \$1.35
2-lb. pkg. bees, 4.25; 25 or more... 3.83	Tested, \$2.50 each; 25 or more..... 2.25
3-lb. pkg. bees, 6.25; 25 or more... 5.62	Select tested, each..... 3.00

Add price of queen wanted when ordering bees.

NUECES COUNTY APIARIES -:- CALLEN, TEXAS
E. B. AULT, Prop.

Modified Dadant Hive



The Modified Dadant Hive has 40 per cent larger Brood Comb Area than the Ten-Frame Langstroth Hive.

A glance at this illustration shows you why the MODIFIED DADANT hive should be in your apiary. See the large size compared with the 10-frame "Standard!" Features embodied in this hive are:

1. A deep frame.
2. A large brood-chamber in one story.
3. Ample ventilation by wide frame spacing.
4. Excellence in wintering.
5. Swarming easily controlled.

Modified Dadant Hive Features

1. Eleven frames, Langstroth length, Quinby depth.
2. Frames end-spaced $1\frac{1}{2}$ inches for swarm control.
3. Extracting frames $6\frac{1}{4}$ inches deep.
4. Dovetailed body, regular reversible bottom and metal roof cover with inner cover.
5. Langstroth "standard" equipment easily used with it.

Made by G. B. Lewis Company

SOLD BY DISTRIBUTORS OF LEWIS "BEEWARE"

For free booklet write either to

G. B. Lewis Co., Watertown, Wis.
Dadant & Sons, Hamilton, Illinois

Marketing & Supply Service

for

Rocky Mountain Beekeepers

We want to enter into agreements with all the responsible beemen in the Rocky Mountain territory to market their honey. But we will not accept business unless we are sure we can handle it properly. We are constantly extending and improving our ways of distribution.

Service is what you want, and we stand ready to serve you. Our service includes Honey Marketing, Market Bulletins, special advances on your honey crops and on your honey in storage, selling bee supplies at a low fixed profit, cash for your crop as soon as shipped, pools, etc.

If you have some honey on hand at the present time and want to market it before the new crop comes on, let us hear about it. We would like a letter from every producer in Colorado, Wyoming, Utah, Idaho, and New Mexico. Bring us your latest beekeeping problem; let us give you prices on supplies and honey containers; write about extending your business; we will be glad to serve you in any way. We handle Root's Quality Bee Supplies.

Service First and All the Time. Rather than judge us by our promises, judge our ability and the honesty of our intentions by our past. Ask the men who have been dealing with us. Our organization stands for two things: First, bigger, better, and more profitable beekeeping. Second, building a national demand for honey as an everyday food.

We want to express publicly our appreciation of our many customers who have been dealing with us so satisfactorily in the past and who are coming back to us with their valued business this year. It is their confidence and support that have made our growth possible. They can tell you that Wesley Foster did not have a beekeeper dealing with him in 1917, 1918, or 1919, that carried over any honey. We ask that you refer to the Nat. State Bank of Boulder, Colo., or to any Mercantile Rating Agency as to our financial strength and business integrity. We have unlimited confidence in Beemen, and we want them to feel the same confidence in us.

To
FOSTER Your Business
Is a Very Wise Thing

The Foster Honey and Mercantile Co.
Boulder, Colorado

CONFIDENCE

Riverton, Wyo., Jan. 31, 1920

*The A. I. Root Company
Medina, Ohio.*

Gentlemen: I am writing you regarding the coming crop of honey. I feel that I am entitled to a first chance to sell you my crop, for I buy almost everything I use in my business in the bee line of you. I will ship you my entire crop of honey at the market price or a price we agree upon. I have 1,000 colonies, and if I have a fair crop I should have from 100,000 to 150,000 lbs.

There is one other reason I am writing you at this date, and that is I am counting on being up in Alaska and Yukon territory when my crop of honey is being harvested, and I feel that I can absolutely trust The A. I. Root Company for fair dealing and honesty whether I am in Alaska or at home.

Yours truly,

B. M. Caraway.

"SAG-PROOF" FRAMES

Stop losing dollars from sagged brood-combs!
Use frames wired to support combs properly.
Follow the lead of America's best beekeepers.
Use Lewis "Sag-Proof" frames in your hives.

HOW THEY ARE MADE.

Expensive machinery installed in the Lewis "Beeware" factory pierces Hoffman end bars so the wiring holes come nearer the top bar and give support where it is most needed—at the top.

Principles involved in this improvement have been approved from actual samples sent to and used by such leaders as Frank Rauchfuss, G. S. Demuth, J. E. Crane, A. G. Woodman, E. G. LeSturgeon, N. E. France, Ben Davis, H. D. Murry, E. S. Miller, F. B. Paddock, H. F. Wilson, G. H. Rea, E. G. Baldwin, and the Dadants.

Dr. C. C. Miller, after examining samples sent to him, wrote: "The new wiring, as compared with the old wiring with the upper wires farther apart, ought to be worth many dollars to the business of honey production."

Get in line and use Lewis "Beeware" now. "Sag-proof" frames are just one instance of our interest in your beekeeping success. Your catalog gives your distributor's name.

Look
for



This
Mark

G. B. LEWIS COMPANY

Branches and Distributors Everywhere

WATERTOWN

WISCONSIN

Write for booklet, "How to Manage Bees in Spring," price 5c.